

LONGITUDINAL ANALYSES OF MENTAL HEALTH
IN A COHORT OF EMERGING ADULT
MEN WHO HAVE SEX WITH MEN

by
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Abstract

Background: Research persistently indicates that young men who have sex with men (YMSM) are at greater risk for mental health problems than their heterosexual peers. To date, research that demonstrates disparities in distress and suicide behavior has been inherently comparative and has not examined within-group heterogeneity in the mental health of YMSM, especially during emerging adulthood.

Methods: Three analytic methods were used to test for longitudinal heterogeneity in mental health in a cohort of 600 emerging adult YMSM. YMSM were recruited in New York City at ages 18-19, and completed three years of biannual follow-ups. This dissertation uses yearly data, providing four time points. Latent class growth analysis and growth mixture models were used to test for latent trajectories of psychological distress. Internalized homonegativity was examined using latent growth curve models. Finally, generalized estimating equations were used to model suicide ideation.

Results: Longitudinal heterogeneity existed in the three mental health indicators. Three distinct trajectories of psychological distress were identified. Internalized homonegativity typically decreased over time, but with significant variability in individuals' own trends. The prevalence of suicide ideation decreased with time, but several factors were associated with ideation risk. Across the three analyses, several themes emerged with regard to covariates. First, childhood neglect was associated with an improving distress trajectory, but greater likelihood of suicide ideation. Internalized homonegativity had a persistent association with psychological distress. Social relationships (i.e., others' negative reactions to homosexuality, exposure to peer suicide attempts) were also

relevant to mental health. Most YMSM had low levels of distress, low levels of internalized homonegativity, and did not experience suicide ideation.

Conclusions: There was significant heterogeneity in mental health among emerging adult YMSM. Most men did not have mental health problems, and improvements over time were common. Findings align with both the existing literature on sexual minority youth and emerging adults more generally. Still, for each mental health indicator, some YMSM indicated poorer mental than their peers. Adverse childhood experiences and psychosocial factors had nuanced and distinct relationships with emerging adult mental health. Psychosocial factors, rather than sociodemographic categories, are salient to the mental health of these YMSM.

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Table of Contents

| | |
|--|-----|
| Chapter 1: Introduction and Literature Review | 2 |
| Chapter 2: Overview of Methods | 18 |
| Chapter 3: Trajectories of Psychological Distress in Emerging Adult Young Men Who Have Sex With Men | 28 |
| Introduction | 30 |
| Methods | 33 |
| Results | 38 |
| Discussion | 40 |
| Conclusions | 45 |
| Chapter 4: Latent Growth Curve Analysis of Internalized Homonegativity in Emerging Adult Young Men Who Have Sex With Men | 56 |
| Introduction | 58 |
| Methods | 63 |
| Results | 67 |
| Discussion | 71 |
| Conclusions | 78 |
| Chapter 5: A Longitudinal Analysis of Suicide Ideation in Emerging Adult Men Who Have Sex With Men | 89 |
| Introduction | 91 |
| Methods | 104 |
| Results | 111 |
| Discussion | 115 |
| Conclusions | 125 |
| Chapter 6: Synthesis and Discussion of Findings | 131 |
| References | 149 |
| Curriculum Vitae | 164 |

List of Tables

Manuscript 1

| | |
|---|----|
| Table 1. Sample descriptives | 47 |
| Table 2. Overview of alternative models..... | 48 |
| Table 3. Class estimates and descriptives..... | 49 |
| Table 4. Multinomial logistic regression with covariates..... | 50 |

Manuscript 2

| | |
|--|----|
| Table 1. Time-invariant sample descriptives..... | 80 |
| Table 2. Time-varying sample descriptives and covariates..... | 81 |
| Table 3. Summary of MLR estimates for Models 1-5..... | 82 |
| Table 4. Model 5, final model with time-invariant and time-varying covariates..... | 84 |

Manuscript 3

| | |
|---|-----|
| Table 1. Sample descriptives..... | 127 |
| Table 2. Cross-sectional, baseline multivariable model of suicide ideation..... | 128 |
| Table 3. Longitudinal multivariable model of suicide ideation..... | 129 |

List of Figures

Manuscript 1

| | |
|--|----|
| Figure 1. Sample means and estimated means, 3 classes. | 51 |
| Figure 2. Class 1: Mean trajectory and observed trajectories. | 52 |
| Figure 3. Class 2: Mean trajectory and observed trajectories. | 53 |
| Figure 4. Class 3: Mean trajectory and observed trajectories. | 54 |

Manuscript 2

| | |
|--|----|
| Figure 1. Observed sample mean vs. estimated mean – final model, Model 5. | 86 |
| Figure 2. Graph of $n = 39$ (i.e., 10%) randomly-selected observations. | 87 |

Chapter 1:

Introduction & Literature Review

Chapter 1: Introduction and Literature Review

In this review, I summarize the existing literature regarding the mental health of young men who have sex with men (YMSM), with attention to depression and distress, internalized homonegativity, and suicide risk. I begin by reviewing the evidence for mental health disparities among YMSM, along with the public health significance of these issues. Next, I describe what is known about factors that underlie mental health problems in YMSM, with specific focus on victimization, childhood experiences and contexts, and stress that is often inherent to adolescence and emerging adulthood, which is conceptualized as the period between ages 18 and 25.¹ Consistent findings that most YMSM and SMY evidence good mental health are also reviewed. Finally, I conclude by reviewing the challenges to synthesizing the existing body of literature, and identify gaps to address in future research

As sexual minorities, young men who have sex with men (YMSM) experience well-documented health and mental health disparities in the United States.² Research has persistently indicated that YMSM and other sexual minority youth (SMY)¹ are at greater risk for mental health problems than heterosexual peers; these problems include psychological distress (e.g., depression and depressive symptoms), and indications of suicide risk (e.g., suicide ideation and attempts).²⁻²⁷ Similar disparities are evident in adult MSM. For example, in a review of population and convenience samples from the

¹ This dissertation focuses specifically on young men who have sex with men (YMSM). However, the existing mental health literature has often examined ‘sexual minority youth’ or ‘male sexual minority youth’ as single groups. This is largely attributable to the preponderance of comparative studies (i.e., sexual minorities compared to heterosexuals). Where possible, this review notes YMSM-specific findings. Additionally, much of the literature has categorized YMSM and SMY as “youth” (e.g., under 18) or adolescents (e.g., 13-18), or young adults (e.g., age 18 through the 20s). “Young” men who have sex with men is used somewhat interchangeably in the literature to refer to any of these groups.

U.S., U.K., Netherlands, and Austria using various measures of depression, prevalence of depression among adult MSM ranged from 8-13%, compared to 3-6% of heterosexual men.²⁷ YMSM-specific samples also indicate high prevalence of distress. In recent study of urban YMSM using structured diagnostic interviews, a third indicated a lifetime diagnosis of major depressive episode, with nearly 1 in 5 indicating a major depressive episode in the prior year.²⁸ Similarly, Kipke et al.²⁹ found that a fifth of YMSM evidenced depression as indicated by a CES-D score ≥ 22 , and 10% reported that they had “seriously considered attempting suicide” in the past 12 months. With regard to suicide, a recent meta-analysis of both recent and lifetime data estimated that 28% of male SMY report suicide behaviors (i.e., ideation, planning, attempts)⁸ and comparable rates were found in past year ideation (25%), planning (22%) and attempts (21%) among male SMY.⁴ Like the parallels in youth and adult male sexual minority depression disparities in depression, adult men who have sex with men (MSM) also report greater prevalence of suicide ideation and attempts (40%-55% lifetime prevalence) than heterosexual men (8% to 25%).²⁷ Taken together, these robust findings indicate that male SMY and YMSM are at greater risk for mental health problems and similar inequities appear to persist in adulthood.

Public health significance of depression and suicide. Depression has significant and well-documented impacts on health. Unipolar major depression is the leading overall cause of disability adjusted life years (DALYs) in the developed world, accounting for 12% of DALYs.³⁰ Among males ages 15-44, unipolar depression is the 3rd leading causing of DALYs and accounts for 7% of DALYs.³⁰ The impact of depression on overall health outpaces other chronic conditions as well; data from the WHO World

Health Survey indicate that depression is associated with significantly poorer mean health scores than chronic conditions including asthma, angina, arthritis, or diabetes.³¹ As it manifests at the individual level, depression is known to have major impacts on work productivity, financial stability, and home- and social life.^{32; 33} Further, there is a dose-response relationship between the severity of depression and the severity of the interrelated economic, health, and social impairments.³² Among YMSM specifically, depression is associated with other health risks including sexual risk behavior^{34; 35} and substance use.³⁵ There is also evidence that depression is a component of syndemics among YMSM, suggesting that depression is interrelated with other health disparities (e.g., substance use) that lower the health of YMSM populations.^{22; 35; 36} Finally, the relationship between depression and suicide risk behaviors is robust and well-established.^{8; 10; 21; 37-42} Like depression, addressing suicide is also a global health priority.⁴³ Among adolescent and young adult males globally, suicide is estimated as the third-leading cause of death.⁴⁴ This figure may in fact be an underestimate, as suicide is likely underreported among adolescents and young adults.⁴³ Taken together, there is strong and consistent evidence that depression and suicide are significant public health issues, and further, are well-documented health disparities among YMSM. Public health has an ethical imperative to address these disparities in its pursuit of health equality and social justice.^{45; 46}

Underlying social factors. While trends across several decades and recent data indicate that the U.S. population is increasingly accepting of homosexuality,⁴⁷⁻⁴⁹ overt and covert forms of homophobia and heterosexism continue to negatively impact the health of YMSM and sexual minorities.^{2; 50} These are socially produced disparities.^{13; 18;}

^{22; 51-53} For example, the existing literature has examined factors such as discrimination and victimization, childhood adversity, and reduced availability of social and institutional supports for YMSM as factors that underlie mental health disparities.

Before these social factors are discussed, it is also important to note internalized homonegativity as a potential co-occurring stressor. Internalized homonegativity arises when YMSM assimilate homophobic and heterosexist messages into their attitudes about the self.^{2; 22; 54-56} Internalized homonegativity may arise from some men's efforts to repress or change their same-sex desires, potentially compounding the external stressors encountered in the social environment.^{2; 22; 54-57} Internalized homonegativity has numerous health impacts for YMSM, including psychological distress,^{50; 56-63} negative impacts on sexual identity development and social integration,^{16; 22; 57; 63; 64} risk behaviors including school truancy, poor academic performance, substance use, and sexual risk behavior,⁶⁴⁻⁶⁶ and impacts on utilization of quality health care.² Finally, YMSM themselves may enact intra-group homophobia to reinforce internal or external perceptions of their sexuality.^{54; 55} Internalized homonegativity has been characterized as "particularly insidious" and "nonconscious" in youth.⁵⁷ However, there is a need for further research that examines internalized homonegativity as a construct, as well as its outcomes and associated psychosocial factors. For example, internalized homonegativity often correlates with lower self-esteem; however, additional research is needed to assess whether internalized homonegativity as a construct is distinct from self-esteem and negative affect.⁶³ In a review of the literature, Syzmanski⁶³ also identified a need for research exploring the psychometrics and performance of internalized homonegativity scales among bisexuals and racial/ethnic minority groups. Additionally, nearly all

internalized homonegativity research has been cross-sectional, and there is a need for longitudinal research.⁶³

Victimization. SMY and YMSM are at greater risk for bullying and other victimization by their peers.^{2; 3; 13; 22} This victimization is associated with psychological distress, including depression and suicide behaviors.^{3; 12; 16; 22; 52; 67-69} As noted earlier, YMSM may attempt to hide, suppress, or change their sexual orientation or self-police gender non-conforming behaviors to proactively or reactively guard against these experiences, likely exacerbating distress.⁵⁷ Additionally, YMSM may have expectations of limited “citizenship” based on the heterosexism they observe in the world around them.⁵¹ These experiences occur within a social context of potentially limited availability of supports and buffers that might otherwise have protective effects.^{57; 67; 70-72} These supports and buffers include both social (e.g., peer, family) and institutional (e.g., schools) supports that are key to adolescent and emerging adult developmental experiences.^{11-13; 17; 22; 25; 57; 70; 72-76}

Childhood factors. Other factors in childhood and adolescence shape SMY and YMSM mental health. First, SMY and YMSM disproportionately experience childhood neglect and abuse.^{2; 23; 25} For example, Hightow-Weidman et al.⁶⁷ found that two-thirds of the YMSM in their sample had experienced abuse by parents, with a quarter of those men reporting physical injuries as a result of the abuse. Though the reasons underlying disproportionate prevalence of abuse among SMY have not been empirically identified, Friedman et al.⁷⁷ note that factors such as gender role non-conformity and age of gay-related development (e.g., age of coming out, age of sexual debut) warrant study.

For youth of any sexual orientation, adverse childhood experiences (ACEs) such as abuse have health implications across the lifespan.^{25; 78; 79} In the general population, ACEs are associated with psychiatric disorders or problems,⁷⁸ including increased risk for suicide in young adulthood and adulthood.^{41; 43; 80} This elevation in risk also exists for sexual minorities. ACEs are associated with greater suicide risk for adult MSM⁷¹ and SMY,²⁵ and psychiatric outcomes such as depression among SMY.²⁵ In addition to specific outcomes like suicide risk, McLaughlin et al.²⁵ note that ACEs can also induce a “cascade of psychological, physiological, and social processes” that are likely to exacerbate future stress exposures. As an example of these distal, more downstream outcomes, MSM who experienced forced sex or physical abuse in childhood were more likely to report intimate partner abuse, gay victimization, and depression.⁷¹ ACEs such as abuse, neglect, and parental psychopathology often cluster^{79; 81} and co-occur with other problematic characteristics of parenting and the family context.⁸²

Religion. Religious affiliations and practices in the family also have potential implications for YMSM mental health. Sexual minority adults in the U.S. perceive that major religious groups are typically “unfriendly” to lesbian, gay, bisexual, and transgender individuals.⁴⁹ In particular, Muslim, Mormon, Catholic, and evangelical religions are perceived by LGBT adults as holding particularly negative views regarding homosexuality,⁴⁹ and Black YMSM have identified the church as a prominent source of homophobic messages.⁵⁴

Research addressing the potential influences of religion or religiosity on the mental health of YMSM is sparse. Family religious practices and affiliations are potential sources of discrimination and homophobia experienced by YMSM, both directly (e.g.,

via religious sermons) and indirectly (e.g., via religious attitudes of family members).^{54; 66} Ryan et al.⁸³ found that having a general religious affiliation and higher levels of religiosity in the family were each associated with less family acceptance of SMY. Higher levels of internalized homophobia also manifest among religiously-involved SMY.^{60; 84} Conversely, some YMSM enact resistance against religious homophobia, and find religion to be a protective source of support.^{54; 66} Notably, there is a dearth of research that examines spirituality among YMSM. This is an area for future research, as YMSM have articulated tenets of spirituality as sources of purpose in life, resilience, and support.⁶⁶ It may be that spirituality, as a distinct but related concept, contributes to, or underlies, the protective mechanisms conferred by ‘religion.’ Indeed, LGBT adults have articulated the salience of spirituality as positive influences in their lives, typically in contrast with childhood or earlier-life religious affiliations.⁸⁵

Stress inherent to adolescence and emerging adulthood. While a subset of SMY and YMSM are known to experience these sexual-minority specific stressors (or, in the case of ACEs, disproportionate prevalence), not all SMY or YMSM do. It is also important to note that adolescence and emerging adulthood are periods of exploration and development and thus typically entail stressful events and periods for all youth, and distress and suicide behaviors among YMSM may be unrelated to sexual orientation.^{57; 76;}⁸⁶ Yet, much research has implicitly or explicitly assumed that observed mental health problems are attributable to sexual orientation, rather than other stressors experienced by adolescents regardless of their sexual orientation, such as social support, socioeconomic stressors, and family dynamics.⁵ Similarly, media coverage of SMY suicides and SMY suicide research implicitly frames suicide as solely attributable to their sexual minority

status, neglecting the other components of the individual's life that are related to distress or suicide risk.⁸⁷

Wellness and resilience. Despite population-level evidence of disparities when compared to heterosexual peers, most SMY and YMSM are neither significantly distressed nor indicating suicide behaviors.^{2; 16; 67; 88-90} For YMSM who do evidence symptoms of depression, these symptoms are often not severe or disabling.¹² Additionally, psychological distress or suicide risk behaviors tend to attenuate over time,^{7; 57; 73; 86; 89-93} and most YMSM grow into resilient, healthy adult MSM.²² Low prevalence of mental health problems and improvements over time are likely attributable to developmental successes,⁸⁶ processes of sexual identity development (i.e., finding and connecting with similar others),^{22; 51; 57; 73; 94} increasing autonomy (psychosocial, financial, and geospatial),¹ and decreasing frequency or intensity of victimization and rejection^{86; 92} over the course of adolescence and emerging adulthood.

Potential differences across sociodemographic groups. In a comprehensive state-of-the-science review of lesbian, gay, bisexual, and transgender health research, the Institute of Medicine identified a need for research that examines gradations in health and life experiences across sociodemographic groups.² Race, ethnicity, and socioeconomic status (SES) have broad, well-documented influences on health inequities^{2; 18; 95; 96} and thus there are plausible health inequities within sexual minority populations, such as YMSM.

Race and ethnicity. To date, there are limited data on differences in YMSM mental health across sociodemographic groups, as existing studies of SMY and YMSM have consisted of predominantly White samples.^{4; 16; 27; 38; 97; 98} In addition to the broader

fundamental causes of health inequities,⁹⁵ racial or ethnic minority YMSM may also experience specific stressors, including homophobia from within their racial/ethnic groups due to cultural attitudes toward homosexuality, racism in the broader social environment, and racism from within sexual minority communities.^{2; 54; 67; 92; 94} Data from the General Social Survey data (GSS) indicate overall decreases in U.S. adults' negative attitudes toward homosexuality;⁴⁷ however, Black and Hispanic adults continue to indicate less tolerance for homosexuality than White adults.^{47; 99}

Among SMY, existing studies have indicated inconsistent racial/ethnic differences in sadness, distress, or depression or suicide risk.^{7; 28; 75; 98; 100} These inconsistencies in findings may be attributable to whether minority stressors such as discrimination or victimization were measured by the study. For example, Mustanski et al.⁹⁸ found no differences across racial/ethnic groups of SMY, however, it is important to point out that the authors examined race/ethnicity as a group-level identity and did not assess experiences or perceptions of racial/ethnic discrimination; thus it is plausible that among YMSM or SMY of color, those who have experienced discrimination may be a subgroup with greater distress.

Cultural attitudes toward mental health and mental health care may also differ across racial/ethnic groups with implications for SMY mental health. For example, these cultural norms may be protective if they inhibit self-harm or substance use,^{4; 21; 27} but may also inhibit utilization of mental health care.¹⁰¹ Indeed, there is evidence of poor access to mental health care among YMSM; this may be particularly true for racial/ethnic minority YMSM.²⁹

Socioeconomic status. Research exploring potential differences in YMSM mental health across socioeconomic strata appears to be especially sparse. Poverty has significant effects on the health and mental health of youth,^{92; 102; 103} and subjective socioeconomic status is also associated with youths' self-rated health.¹⁰³ Socioeconomic resources might also determine access to protective factors such as mental health treatment.² Additionally, the social contexts in sexual minorities' lives are shaped by SES. For example, McGarrity et al.¹⁰⁴ found that for lower-SES gay and bisexual men, "outness" about one's sexual orientation was associated with poorer health experiences and discrimination, while this did not hold true for men of higher SES. Yet, Hatzenbuehler et al.⁵³ found that community-level anti-gay stigma (as defined by community-level data from the GSS) was associated with a 12 year difference in life expectancy for sexual minorities even after controlling for individual-level and community-level SES indicators. Taken together, these findings might suggest that SES exerts some contextual-level mechanisms in sexual minority health, while other structural influences on sexual minority health (e.g., stigma) transcend SES strata.

Sexual orientation. In addition to the gaps in knowledge regarding differences in mental health across race, ethnicity, and SES, there are also gaps with regard to sexual orientation subgroups (i.e., 'minority sexual minorities') in the literature.^{10; 76; 97} As is the case with racial and ethnic identities, collapsing sexual minority youth into a homogenous category (e.g., SMY) obscures nuances relevant to bisexuals as well as those who do not identify as gay or report an exclusively homosexual orientation.^{13; 76; 98} Findings regarding mental health among bisexual youth have been inconsistent, but bisexual SMY may be at greatest risk for distress and associated outcomes such as

suicide behaviors,^{7; 8; 27; 105} or be less likely to experience the decline over time in suicide attempt prevalence seen in other SMY.⁹³ Importantly, sexual orientation is not fixed, especially among youth, and may change over time as a developmental process.^{2; 76} Given this potential fluidity, the experiences of SMY in social contexts may fluctuate partially as a function of their sexual orientation. As will be discussed next within a larger review of limitations, sampling and measurement limitations in existing research present challenges to the analysis and interpretation of “within” sexual minority differences by orientation.

Challenges in synthesizing the existing research. As noted, the majority of existing research has been comparative (i.e., comparing YMSM or SMY to their heterosexual peers) and there is a relative paucity of research that explores potential within-group differences in mental health.^{97; 98; 106} Heterogeneity in mental health trajectories plausibly exists along the lines of race and ethnicity, socioeconomic status, sexual orientation, childhood experiences, and covarying psychosocial factors. Additionally, there are a number of caveats that must be considered with regard to the synthesis of the existing literature, and these observations may yield insights into the inconsistent findings to date.

The variability in assessment and analysis of sexual orientation groups presents the greatest challenge to synthesizing findings in this review. As noted, the literature that demonstrates YMSM and SMY mental health disparities is inherently comparative. While large-scale and population-representative studies yield critical and robust data on these disparities, they typically have low overall subsamples of sexual minority youth. Not only does this preclude within-group analyses (e.g., comparing racial/ethnic

subgroups of YMSM), but it also has meant that “sexual minority youth” are commonly grouped together for broad, comparative analyses.

In these studies, the construct of sexual orientation has not been assessed in all jurisdictions (i.e., only some jurisdictions include these questions) and sites have used varying measures of sexuality (i.e., sexual attraction, versus sexual behavior). For example, in the Youth Risk Behavior Surveys, “sexual orientation” has not been assessed in all jurisdictions, and further, sexual orientation has been assessed inconsistently across sites, using questions such as the gender of sexual contacts, the gender of sexual attraction, or sexual orientation identity to assess orientation.^{4; 97} Yet, data also indicate that when compared, measures of sexual behavior and sexual identity do not yield concordance and thus should not be used as proxies for each other.¹⁰⁷

Using sensitivity analyses, empirical data, and theoretically-grounded arguments, researchers have also pointed out that studies’ operationalization and measurement of sexual orientation have influence on study findings.^{19; 26; 27; 76; 105; 107} For example, in a review of published studies examining SMY suicide behavior, Lewis²⁷ noted the significant inflation of suicide attempt prevalence when bisexually-oriented youth and same-gender oriented youth were collapsed into a single group. This potential inflation of risk estimates when SMY are collapsed into a single group has been corroborated with other risk behaviors, such as substance use.¹⁰⁷ While some analyses have focused on delineating the nuances and potential mechanisms underlying bisexually-oriented youths’ greater risks for these outcomes (e.g., Saewyc et al.⁷⁶), the relatively common practice of collapsing all SMY has limited the research that might explain these “sexual minority-minority” health inequities for bisexual youth.

As an alternative to population-representative surveys, community-based samples can provide sufficient numbers of YMSM or SMY to allow for across- and within-group analyses, for example, with regard to race, ethnicity, gender, or sexual orientation. However, these studies typically use convenience sampling, which limits generalizability to other YMSM or SMY. (Although, it is important to note that school-based youth surveys such as the YRBS have generalizability limitations as well; for example, findings are limited to school-enrolled youth and cannot be generalized to non-enrolled or truant youth). Time-space sampling is a more systematic approach for community surveys that can help overcome some limitations of convenience sampling.¹⁰⁸

As discussed, the existing population-representative surveys and community-based samples present challenges to the synthesis of literature regarding YMSM depression, distress, and suicide behaviors. However, each approach has strengths despite caveats, and they are arguably complementary to each other. Population-representative surveys have been critical to demonstrate that YMSM and SMY do indeed experience mental health disparities. Findings from community-based surveys and convenience samples have added important explanatory nuance, in that these studies have sometimes been able to explore within-group differences.

A second major obstacle to synthesis is the significant variability in how existing studies have measured depression and/or distress. Depression status has been assessed using a spectrum of measures, ranging from single item assessments, use of screening tools, or structured diagnostic interviews.⁸ For example, data from National Longitudinal Study of Adolescent to Adult Health consist of responses to three questions assessing whether the respondent 1) “felt sad,” 2) “felt depressed,” or 3) felt they “could not shake

off the blues” in the prior 7 days.^{86; 109} At the other end of the spectrum, Mustanski et al.⁹⁸ used both structured diagnostic interviews in addition to a screening tool (the Brief Symptom Inventory¹¹⁰). Structured diagnostic interviews are most reliable.³⁰ Indeed, Mustanski et al.⁹⁸ compared results between the structured diagnostic interviews and the Brief Symptom Inventory with regard to major depression; while the latter had a negative predictive power of 90%, it had a low positive predictive power (25%). Without a structured diagnostic interview, existing surveys may be capturing general distress, which is not equivalent to major depression.⁹⁸ As a latent construct, depression is inherently challenging to measure, and these types of methodological variations across studies may help to explain inconsistencies in results.

Gaps in the existing research. Existing studies’ findings point to future areas for research, and a critical review of the literature indicates a number of significant gaps to address. First, there is a need for additional longitudinal research.^{2; 7; 8; 71; 86; 93; 111} Prospective follow-up data may differ significantly from lifetime or cross-sectional estimates,⁹ and longitudinal research with sufficient YMSM subsamples allows testing for potential heterogeneity in mental health trajectories as well as causal pathways in YMSM.^{7; 90; 93} Second, existing research has typically utilized a deficit paradigm that may obscure trajectories of well-being and improvements in mental health that manifest among SMY and YMSM,^{16; 51; 73; 86} and longitudinal data is particularly suited to identify potential trajectories characterized by thriving or resilience.

The described gaps might obscure important heterogeneity in YMSM mental health during a pivotal period of development with antecedents in childhood and implications across the life course.^{1; 7; 22; 72; 76; 86} Additionally, within-group analyses can

begin to shed light on the underlying factors and processes of observed health inequities.¹⁸ For public health interventions and clinical practice, it is also critical to identify and target the YMSM at greatest risk. A longitudinal perspective that tests for heterogeneity allows for conceptualizing risk on a spectrum and in relation to time and development, rather than a binary and static notion of “risk” or “not at risk.” Different points on this continuum likely necessitate tailored approaches.^{8; 13; 105} However, we must first establish and characterize this potential spectrum, and then identify the factors that predict an individual’s location within the spectrum.

Chapter 2:

Overview of Methods

Chapter 2: Overview of Methods

Parent study overview. *Syndemic Production among Emerging Adult Men* (NIDA R01DA025537; PIs: Halkitis & Kapadia) is a longitudinal study of substance use, sexual risk behavior, and mental health among young men who have sex with men (YMSM) in New York City. The study followed a cohort of 600 YMSM during a three-year period in emerging adulthood. Using a syndemics framework^{22; 36; 112} the study sought to explore biopsychosocial factors that might explain documented HIV disparities among YMSM. The study was guided by the following aims: 1) To develop and test theoretically informed measurement models of the covariance of illicit drug use, unprotected sexual behavior, and mental health burden among emerging adult HIV-negative YMSM within and sexual behavior, and mental health burden; 2) To delineate the risk and protective bases—physical factors, relational factors, and psychosocial factors that predict the development of syndemics; and 3) To determine the extent to which the development of syndemics varies by race/ethnicity, social class, and homelessness/housing instability in a cohort of HIV-negative YMSM.

Recruitment. Men were recruited and enrolled between May 2009 and July 2011 using three approaches. These included (1) active methods (e.g., recruiters approached all passerby in a given area and distributed palm cards) and passive methods (e.g., flyers posted) in diverse venues across the 5 boroughs of NYC. Venues were both sexual minority-focused venues (e.g., dance clubs, annual LGBT Pride events, community organizations serving sexual minorities) and general venues (e.g., college campuses, general community organizations) that were selected using formative research.

Throughout the study period, recruitment venues were refined based on ongoing monitoring of recruitment yield and informal feedback from community members. Additionally, (2) enrolled participants could receive additional remuneration for referring up to 2 peers to the study. Third (3), Internet-based recruitment was undertaken on sexual minority-focused networking websites (e.g., Adam4Adam) and general social networking sites (e.g., Facebook). Internet recruitment consisted of banner advertisements, profile pages representing the study, and/or direct messages to users, based on the availability of paid advertising and messaging features.

Study recruiters were trained research staff as well as undergraduate- and graduate-level interns and community volunteers who were part of a training program at the research center. Recruiters were diverse in terms of age, gender, race and ethnicity, and educational background. Many, but not all, staff and recruiters self-identified as sexual minorities.

Sampling. YMSM were eligible if they were 18-19 years old, reported biological male sex, self-reported an HIV-negative or unknown serostatus, resided in the New York City metropolitan area (NYC, Westchester, CT, NJ) at baseline, and had been sexually active with another man in the prior six months. Military enlistment, pre-enrollment refusal to undertake a urine-based drug metabolite screening randomly assigned to 50% of men at each wave, or pre-enrollment refusal to undertake HIV antibody testing resulted in ineligibility for the study. However, in line with human subjects protections, men were permitted to refuse HIV antibody or drug metabolite screenings on a per-assessment basis, once enrolled.

In order to ensure adequate representation of non-White YMSM, in line with HIV disparities among YMSM of color, we set fixed targets for the enrollment of racial/ethnic minority YMSM so that >66% of the enrolled sample was non-White. Overall, 2,068 men were screened by phone during the recruitment window, and the primary disqualifier (49%) was age >19. A total of 602 men completed the baseline wave; however, 2 Baseline cases were duplicates, and 2 Baseline cases were missing extreme portions of data. Thus, the final Baseline sample consisted of 598 YMSM, though the full cohort consists of 600 YMSM.

Study procedures. The study consisted of 3 years of follow-up, with assessment every 6 months. Men who had relocated outside the NYC metropolitan area were able to complete follow-up surveys via the Internet, using web-based survey software. Approximately 10% of participants in each wave completed the web-based survey remotely due to temporary or permanent relocation¹¹³. Participants who missed an assessment were permitted to resume participation at the next scheduled wave. As a retention incentive, remuneration escalated at each successive study wave (\$35, \$35, \$45, \$55, \$65, \$75, \$100); remuneration amounts were identical for on-site and remote follow-up surveys. Participants who referred peers to the study received an additional \$10 remuneration.

At the baseline assessment, a trained interviewer obtained signed informed consent from each participant. The study was approved by the New York University's institutional review board, the University Committee on Activities Involving Human Subjects (UCAIHS), and because the survey addressed sensitive topics including

substance use and sexual behavior, we obtained a Certificate of Confidentiality from DHHS.

A trained staff member facilitated each appointment. The baseline survey was the longest (~90 minutes) and subsequent surveys were significantly shorter (< 60 minutes). Data was collected using computer-based interviews to reduce literacy burden and social desirability bias.^{39; 114-116} Baseline data were collected using audio computer assisted self-interview (ACASI) software, as all of these surveys were completed on-site. Follow-up surveys were completed using ACASI (participants still in the NYC metropolitan area) or web-based survey software (participants who relocated after Baseline). Several measures used in the parent study (e.g., Timeline Follow Back¹¹⁷) required face-to-face administration by trained interviewers; however, none of these measures were used in this dissertation.

Trained HIV counselors conducted provided a rapid HIV antibody screening at each visit. Pre- and post-test counseling was provided with each test; this included informed consent procedures and tailored risk reduction information. Men with reactive antibody screenings were referred to community health care providers with whom we established referral relationships. These sites provided confirmatory HIV testing (e.g., Western blot) and initiated appropriate HIV care. Men with confirmed HIV-positive serostatus at follow-ups did not receive rapid HIV antibody screenings at future follow-ups. At each assessment wave, a computer randomly selected 50% of participants to complete a urine-based drug metabolite screening.

Data used for analysis. The data presented in this dissertation were taken from the yearly assessments (Baseline, Month 12, Month 24, and Month 36). Retention of the

Baseline sample was high, with 84% (n = 504) of men completing Month 12, 83% (n = 497) of men completing Month 24, and 81% (n = 484) of men completing Month 36 assessments. In summary, the average rate of retention for the yearly follow-ups was 83% of the baseline sample. Prior analyses found no difference in sociodemographics or sexual behavior between YMSM who were retained versus those lost to follow-up.¹¹³

Measures.

Race and ethnicity were assessed at baseline. The measure consisted of two items, (“What is your race?” and “Are you Hispanic/Latino?”). The parent study collapsed these two variables into a single, five-category indicator of race/ethnicity (Black non-Hispanic, Hispanic/Latino, White non-Hispanic, Asian/Pacific Islander non-Hispanic, Multiracial/other non-Hispanic). In Manuscript 1, the variable was dichotomized (e.g., White, non-White) as a covariate representing a minority status. Manuscripts 2 and 3 used the five-category indicator.

Perceived familial socioeconomic status [SES] was assessed at baseline. The measure consisted of a single item (“What do you perceive to be the economic class of the people who raised you?”) with 5 response categories (lower, lower-middle, middle, upper-middle, upper). The parent study collapsed this variable into a three-category indicator of “lower,” “middle,” and “upper” SES. This item does not appear to have been previously validated. There are other established and validated measures of SES.¹¹⁸ However, this item was used for two key reasons: First, the subjective measure was intended to minimize measurement error as 1) youth may not know their parents’ or caregivers’ true income, or they may inaccurately or vaguely report parental occupations,

2) SES could fluctuate over childhood, and we sought a measure to capture overall SES, and 3) measures of SES should be tailored appropriately to the population of study.¹¹⁸

Second, a subjective measure of perceived SES was used given the associations between social standing and health.^{103; 119}

Religion in family of origin was assessed at baseline. Participants were asked, “In what religious affiliation were you raised?” with response categories of “none,” “atheist,” “agnostic,” “Jewish,” “Hindu,” “Muslim,” “Catholic,” “Buddhist,” “Eastern Orthodox Christian,” “Quaker,” “B’ahai,” “Mormon,” “Protestant,” “Baptist,” “Evangelical,” “Other Christian,” and “Other.” Based on the distribution of responses and insufficient cell sizes (e.g., Hindu, n = 2), these categories were collapsed for analyses. The analytic variable categories were “none/atheist/agnostic,” “Jewish,” “Catholic,” “other Christian,” “Protestant,” “Baptist,” and “Other.”

Sexual orientation was assessed at each follow-up using the Kinsey scale.¹²⁰ Men responded on a 7-point scale with anchors of 0 (“exclusively heterosexual”) and 6 (“exclusively homosexual”) with numeric points in between. Based on the distribution of responses, the parent study collapsed this variable to a dichotomous indicator of “exclusively homosexual” or “not exclusively homosexual.”

School enrollment was assessed yearly using a binary yes/no item (“Are you currently in school?”).

Adverse childhood experiences (ACEs) were assessed at baseline with items from the National Longitudinal Study of Adolescent to Adult Health survey, Wave 3.¹⁰⁹

Neglect of basic childhood needs was assessed using the item “How often had your parents or other adult care-givers not taken care of your basic needs, such as keeping you

clean or providing food or clothing?” *Sexual abuse by a caregiver* was assessed using the item “How often had one of your parents or other adult care-givers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?” Finally, having experienced *social services investigation or removal from the home during childhood* was assessed using two items, “How often had Social Services investigated how you were taken care of or tried to take you out of your living situation?” and “How often had you actually been taken out of your living situation by Social Services?” The response option was an open-ended frequency. These variables were collapsed into binary yes/no indicators for each item.

Parental history of depressive symptoms was assessed at baseline with a binary yes/no item (“Did either of your parents ever suffer from depression, did they feel so low for a period of weeks or months that they hardly ate, or couldn't work or whatever they usually did?”).

Psychological distress was measured yearly using items from a cognitive-affective subscale of the Beck Depression Inventory-II.¹²¹ The subscale consisted of 15 questions about the frequency of symptoms (e.g., sadness, self-dislike, anhedonia) in the prior 2 weeks, assessed on a scale of 0 (e.g., “I do not feel sad”) to 3 (e.g., “I am so sad or unhappy that I can’t stand it.”) Responses were summed to create a total score.

The parent study administered the entire BDI-II, which has been used successfully with sexual minority youth.^{13; 122} Mean BDI-II scores in the parent study sample at each wave (M = 9.95, 8.05, 7.28, and 7.38) were lower than those observed in a convenience sample of SMY (i.e., 29.96¹³) and comparable to those reported among sexual minority males (9.63) in Bauermeister et al.¹²²). This full BDI-II score also includes a somatic

symptom subscale. A principal component analysis (PCA) within the sample suggested two underlying factors (suggested by eigenvalues and visual inspection of a scree plot) as anticipated. However, a series of factor analyses for each wave using both oblique (promax) and orthogonal (varimax) rotations indicated that somatic items tended to have high uniqueness (e.g., > 0.7) and/or low loading on either factor (e.g., < 0.40). Conversely, the cognitive-affective items evidenced low uniqueness and/or high factor loadings. The literature indicated that somatic complaints can occur among adolescents without regard to depression,¹²³ and positive or negative responses to somatic items may be “noise” that is not related to depression.¹²⁴ Based on 1) published empirical data, 2) the present factor analysis, and 3) plausibility of somatic “noise” among urban-residing emerging adults, all analyses in this dissertation used this cognitive-affective subscale as a measure of psychological distress. This 15-item distress subscale had high reliability across the four waves (alphas = 0.90 to 0.93).

Internalized homonegativity was measured yearly using a four item scale from the Young Men’s Survey as reported in Thiede et al.¹²⁵ The 4 items were “Sometimes I dislike myself for being gay or bisexual,” “I feel stress and conflict within myself over having sex with men,” “Sometimes I wish I was not gay or bisexual,” and “I sometimes feel guilty after having sex with men.” Men responded on a 5-point Likert scale that ranged from “strongly disagree” to “strongly agree.” A total score was created using the sum of the 4 items. The scale had high reliability across the four waves (alphas = 0.86 to 0.89).

Suicide behaviors were assessed yearly using items from the National Longitudinal Study of Adolescent to Adult Health surveys.¹⁰⁹ Men were asked about

their own *suicide ideation* (“During the past 12 months, did you ever seriously think about committing suicide?”), *suicide attempts* (“During the past 12 months, how many times did you actually attempt suicide?” and *medically-serious attempts* (“Did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?”))

Suicide behavior exposures were assessed yearly using items from the National Longitudinal Study of Adolescent to Adult Health surveys.¹⁰⁹ Men were asked about their *knowledge of friends’ suicide attempts* (“Have any of your friends tried to kill themselves during the past 12 months?”) and *knowledge of family members’ suicide attempts* (“Have any of your family members tried to kill themselves during the past 12 months?”) If men indicated friends’ or family members’ attempts, a follow up question regarding *suicide completion* was asked for the respective friend/family category (“Did any of them succeed?”).

Utilization of mental health treatment was assessed at baseline (“Have you ever seen a mental health professional for counseling/therapy or treatment in the past?”) and at yearly follow-ups (“In the last 12 months have you seen a mental health professional for counseling/therapy or treatment?”) using single binary items. *Health insurance coverage* consisted of a single binary item (“Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or governmental plans such as Medicare or Medicaid?”).

Chapter 3:

Trajectories of Psychological Distress in Emerging Adult Young Men Who Have Sex With Men

Chapter 3: Trajectories of Psychological Distress in Emerging Adult Young Men Who Have Sex With Men

Abstract

Purpose: Comparative research indicates that young men who have sex with men (YMSM) are at increased risk for depression or psychological distress when compared to their heterosexual peers. However, less is known regarding potential differences among YMSM with regard psychological distress. This analysis sought to explore within-group heterogeneity in a diverse sample of YMSM.

Methods: Growth mixture models were used to examine trajectories of psychological distress in a longitudinal sample of 588 emerging adult YMSM recruited in New York City. Men were enrolled at ages 18-19, and completed four yearly assessments of psychological distress. Race/ethnicity, perceived familial socioeconomic status, and adverse childhood experiences were tested as predictors of trajectory membership.

Results: Three distinct trajectories were identified: low and stable distress, moderate and increasing distress, and high but substantially decreasing distress. The majority of YMSM were in the low and stable trajectory. Neglect of basic needs and sexual abuse were associated with a trajectory of high but substantially decreasing distress. Parental depressive symptoms were associated with moderate and increasing distress.

Conclusions: Sociodemographics were not associated with trajectory membership. YMSM who experienced childhood adversities were more likely to exhibit substantial improvements in distress over the three years, perhaps attributable to increasing

autonomy during this period of development. History of parental depression was associated with the highest-risk trajectory.

Introduction

Young men who have sex with men [YMSM] experience well-documented mental health disparities.² Broadly, evidence strongly indicates that sexual minority youth [SMY] are at greater risk for psychological distress, including depression and depressive symptomatology, compared to their heterosexual peers.²⁻¹⁴ These disparities have significant implications for health^{31; 126} and for YMSM, depression and other forms of psychological distress may also cluster with associated behavioral risks, for example, substance use, sexual risk behavior, or suicide behavior^{2; 17; 35; 57}

Nothing inherent to sexual orientation explains this disproportionate risk of depression and suicide. Rather, these are socially produced disparities.^{13; 18; 22; 51-53} Succinctly, these disparities may be attributed to the stressors experienced by youth, such as experiences of discrimination, victimization, and homophobia, anticipated heterosexism, and the internalization of homophobia.^{18; 52}

Health and resilience. Importantly, as is the case with youth more broadly,⁸⁶ many sexual minority youth do not experience significant psychological distress and are, in fact, resilient and healthy.^{2; 16; 67; 88-90}. Further, SMY who are experiencing distress or depression may not experience disabling levels of distress,¹² and also tend to experience improvements in mental health over time.^{73; 86; 89-92; 111} These improvements may be attributable to successfully navigating the challenges and explorations of emerging adulthood⁸⁶ (i.e., intrinsic processes of development), along with decreases in victimization or rejection^{86; 92} or finding social connection and community with similar others⁷³ (i.e., socioenvironmental changes). For example, youth who experience stressors

in their family or peer social circles might experience increased autonomy during emerging adulthood.¹ Indeed, most YMSM emerge as resilient, healthy adult MSM.²² Taken together, the literature indicates that YMSM experience levels of distress that likely vary both across and within individuals.

Adverse childhood experiences. Prior research has indicated that SMY may be more likely to experience childhood abuse, physical victimization, or sexual victimization than their heterosexual peers.^{2; 23; 25} Adverse childhood experiences (ACEs) such as abuse and parental psychopathology have been associated with early-onset psychiatric disorders in the general population,⁷⁸ as well as in SMY more specifically.²⁵ There is also evidence that the effects of these adversities persist into young adulthood and middle/late adulthood.⁷⁹ McLaughlin et al.²⁵ note that in addition to the most proximal sequelae of these adverse experiences, adverse experiences may “set in motion a cascade of psychological, physiological, and social processes that increase the likelihood of being exposed to other stressful life events, further compounding the mental health risks associated with these experiences” (p. 652). Indeed, Friedman et al.⁷¹ found that adversities such as forced sex before age 18 and physical abuse by a parent or caregiver were associated with adult experiences of intimate partner abuse, gay victimization, and depression, among other outcomes.

Gaps in existing research. Aforementioned inequities in mental health among SMY and YMSM are well-documented in research comparing sexual minority youth to their heterosexual peers. However, little is known regarding the heterogeneity in mental health *within* YMSM populations. Large-scale, national studies (e.g., YRBS, Add Health) that underpin existing comparative research typically lack sufficient subsamples to

analyze differences within sexual minority subpopulations.^{97; 98; 106} Such analyses have implicitly examined YMSM as a monolithic population; however, YMSM are not a homogenous group.^{26; 70; 76; 97; 111}

Sociodemographics. Given the broad, well-documented influences that race, ethnicity, and socioeconomic status have on health,^{2; 18; 95; 96} potential within-group disparities may exist for racial/ethnic minority YMSM. Similarly, despite indications that poverty has significant effects on the health and mental health of youth,^{92; 102; 103} research examining differences in YMSM health across socioeconomic status (SES) is also sparse in the literature. Accordingly, the Institute of Medicine has identified a need for research that explores gradations in sexual minority health across sociodemographics.² Among SMY, studies have indicated inconsistent racial/ethnic differences in sadness, distress, or depression^{4; 27; 28; 75} self-harm,⁴ or suicide behavior.^{7; 28; 75; 100}

Longitudinal research. There is also an identified need for longitudinal research,^{2; 7; 8; 71; 86; 93; 111} particularly research that examines heterogeneity in YMSM mental health trajectories.^{7; 90; 93} In this period of development, YMSM likely undertake significant exploration and life changes;¹ accordingly, they may experience changes in mental health during this period. However, the literature to date has not explored these potential trajectories among emerging adult YMSM.

Summary. Though there is abundant evidence demonstrating that YMSM are at greater risk for depression and psychological distress, less is known about potential heterogeneity in distress among YMSM. This paper examines psychological distress in YMSM with attention to sociodemographics, childhood adversities, and longitudinal trajectories.

Methods

Study design and sample. The parent study was a longitudinal study of drug use, sexual risk, and mental health among YMSM in New York City (NYC) (N = 600). For this analysis, twelve participants were missing data on key variables (e.g., race/ethnicity, history of parental depression); thus, the analytic sample consisted of 588 YMSM. Participants ages 18-19 were recruited and enrolled between May 2009 and July 2011 using three approaches. These included active methods (e.g., trained recruiters approached all passerby in a given area) and passive methods (e.g., flyers posted) in diverse venues across the 5 boroughs of NYC. Venues were both gay-identified (e.g., dance clubs) and non-gay identified venues (e.g., college campuses) that were identified using extensive formative research. Additionally, enrolled participants received an incentive to refer up to two peers for eligibility screening. Third, Internet-based recruitment was undertaken on gay-identified and non-gay-identified social networking sites.

Enrollment criteria included being 18-19 years old, biological male sex, self-reported HIV-negative or status-unknown serostatus, residence in the New York City metropolitan area (NYC, Westchester, CT, NJ) at baseline, and being sexually active with men in the last 6 months. Military enlistment, pre-enrollment refusal to undertake a urine-based drug metabolite screening randomly assigned to 50% of men at each follow-up, or pre-enrollment refusal to undertake HIV antibody testing resulted in ineligibility for the study. In order to ensure adequate representation of racial and ethnic groups most

impacted by HIV disparities, fixed targets were set for the enrollment of men of color such that >66% of the enrolled sample was non-white. Overall, 2,068 men were screened during the recruitment window, and the primary disqualifier was age >19.

Data were collected over three years of follow-up, and the current analysis uses data from the annual visits (baseline, Month 12, Month 24, and Month 36). All independent variables for the present analysis were time-invariant and reported at the baseline survey. At the baseline assessment, a trained interviewer obtained signed informed consent from all participants. Data for the present analysis was collected using audio computer-assisted self-interview (ACASI) software or web-based survey software. The study protocol was approved by the IRB at New York University and data were protected by a Certificate of Confidentiality from DHHS. To encourage study retention, participants received escalating remuneration at each assessment; for the present analysis, remuneration consisted of \$35, \$45, \$65, and \$100, respectively. Participants were also eligible for \$10 incentives for referring up to two peers to the study.

Outcome variable. Psychological distress was assessed using 15 items cognitive-affective items (e.g., sadness, self-dislike, anhedonia) in the Beck Depression Inventory-II [BDI-II].¹²¹ Participants completed the BDI-II at each yearly survey for a total of 4 time points. During exploratory analyses, an investigation of the performance of the BDI-II at each wave indicated generally noisy responses for the items assessing somatic depressive symptoms. A recent systematic review of depression measures used with children and adolescents found the BDI to have good-to-acceptable sensitivity and specificity, a wide range in PPV (e.g., 0.10 to 0.93), a narrower and higher NPV (0.8 to 0.99), and “high” overall accuracy as defined by AUC analyses.¹²⁷ More broadly, the

BDI-II has been used successfully in studies with sexual minority youth.^{13; 122} One possible explanation for poor performance of the somatic items is that somatic complaints may be more common among adolescents in general, without regard to depression.¹²³ As such, positive or negative responses to somatic items are potentially “noise” that is not related to depression.¹²⁴ In the present sample, the 15-item distress measure had high alphas across the four follow-ups (alphas = 0.89 to 0.93).

Independent variables

Sociodemographic characteristics. Participants indicated their race and ethnicity, which was collapsed into a single variable with categories of Black non-Hispanic, Hispanic/Latino, Asian American/Pacific Islander non-Hispanic, Multiracial/other non-Hispanic, and White non-Hispanic. For the present analysis, responses were further collapsed into a binary variable of “White” versus “racial/ethnic minority.” Perceived familial SES was measured using a single item (“What do you perceive to be the economic class of the people who raised you?”) with responses of lower, lower middle, middle, upper middle, upper. To aid model convergence and model identification in analysis, responses were collapsed into a binary indicator of “higher SES” versus “lower/middle SES.”

Adverse childhood experiences (ACEs). Parental history of depressive symptoms were assessed using a binary item: (“Did either of your parents ever suffer from depression, did they feel so low for a period of weeks or months that they hardly ate, or couldn't work or whatever they usually did?”). Three additional ACEs were assessed using items from the National Longitudinal Study of Adolescent to Adult Health survey,

Wave 3.¹⁰⁹ Neglect of basic needs was assessed using the item “How often had your parents or other adult care-givers not taken care of your basic needs, such as keeping you clean or providing food or clothing?” Sexual abuse was assessed using the item “How often had one of your parents or other adult care-givers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?” Finally, having experienced any social services investigation or removal in childhood was assessed using the two items, “How often had Social Services investigated how you were taken care of or tried to take you out of your living situation?” and “How often had you actually been taken out of your living situation by Social Services?” These count variables were transformed to dichotomous yes/no variables for analysis. A positive response to either or both of the social services questions indicated “social services involvement.”

Analytic approach. First, exploratory analyses were used to describe the data and potential underlying trends. Descriptive analyses were conducted to characterize the sample. The focal analyses for this paper consisted of growth mixture models (GMM) of psychological distress. Succinctly, GMM does not assume that all subjects’ experiences are reflected by a single mean trajectory and variance estimate. That is, while standard growth modeling allows variation in the intercept and slope, a single trajectory is still assumed to universally reflect the sample.¹²⁸ Unobserved populations are not captured in traditional longitudinal analysis (e.g., marginal models), and because these unobserved populations are inherently unknown, it precludes a priori stratified analyses of trajectory groups.¹²⁹ GMM models unobserved classes (i.e., trajectories) that arise from the data.

GMM is person-centered analysis that considers relationships between individuals, rather than relationships between variables.¹²⁸

For the growth mixture models, an iterative process was followed in line with typical LCGA and GMM analysis.¹²⁸⁻¹³² First, a series of unconditional latent class growth models (i.e., LCGA with variances fixed at 0) with $j+1$ classes were fit as an exploratory technique. Both linear and quadratic models were assessed. Next, a similarly iterative (i.e., incremental $j+1$ class models) process was used with conditional models that incorporated the covariates of interest (race/ethnicity, perceived familial SES, parental depressive symptoms, neglect of basic needs, sexual abuse, and social services involvement). For the GMM models, intercept (i), slope (s), and quadratic (q) growth parameters were iteratively freed to be estimated across classes. For each model, several indices of fit and model quality were assessed (i.e., Bayesian Information Criterion (BIC), the Lo-Mendell Rubin test (LMR), the bootstrap likelihood ratio test (BLRT), entropy, class size, and posterior probability estimates). These fit statistics, as well as interpretation of the classes informed by theory, existing literature, parsimony, and visual inspection can help indicate the most appropriate model for the data.^{128; 130-132} Visual inspection of trajectories indicated that the greatest variance appeared in the intercepts (i.e., initial status), and further, more complex models (e.g., estimated slope and quadratic variances, estimated within-class variances) had problems with convergence and/or were not identified models. Thus, only the across-class variance of the intercept was estimated, and the slope and quadratic variances were fixed at zero.

To integrate the sociodemographic and childhood risk covariates, a joint model that estimated the measurement and structural components simultaneously was

implemented. Individuals were assigned to their most-likely class using posterior probabilities; class membership was regressed on the covariates. The regression coefficients represent the log-odds of trajectory assignment compared to the criterion trajectory. Essentially, these covariates can be interpreted as ‘causes’ of class membership.¹²⁹ Either the trajectory with the largest number of individuals, or the most normative (e.g., low, stable levels of depressive symptoms) class was used as the reference class. Maximum likelihood estimation with robust standard errors (MLR) was used for all analyses. Analyses were conducted using Mplus, version 7.31.¹³³

Results

The analytic sample ($N = 588$) is described in Table 1. Of the potential solutions, the 3-class model had the most concordance of fit indices. Other class solutions are detailed in Table 2 for comparison. Visual inspection of the trajectories also indicated sufficient fit to the patterns evident in the data. The model indicated high entropy (0.903), suggesting very clear differentiation of classes (1.0 = perfect). Along these lines, average posterior probabilities for each class were high (0.88 to 0.97) indicating clear differentiation of class assignment based on a given subject’s data. The Lo-Mendell Rubin LRT test was statistically significant ($p = 0.006$), permitting rejection of the null hypothesis that 3 classes did not fit the data better than a 2-class model. Additionally, the bootstrapped likelihood ratio test (BLRT) was also statistically significant ($p < 0.001$), supporting the 3-class solution. Accordingly, the 3-class solution is discussed here. The 3 classes are described in Table 3. The variance of the intercept was significant (7.064, SE

= 1.859), indicating significant heterogeneity in initial levels of distress. Sample means versus model estimated means are depicted in Figure 1. In Figures 2, 3, and 4, each class mean is depicted along with its assigned individual observations.

Class 1 was characterized as “low distress,” as it indicated a low intercept that was significantly different from zero (4.05, $p < 0.001$) and had generally low distress over time. Though the slope (-0.93, $p = 0.006$) and quadratic (0.22, $p = 0.04$) growth factors were significantly different from zero, they evidenced a largely “flat” mean trajectory when taken together. The majority of individuals (83%, $n = 490$) were assigned to Class 1. Class 2 was characterized as “moderate and increasing distress.” Class 2 started with a moderate intercept (10.66, $p < 0.001$) between the Classes 1 and 3; however, distress increased somewhat over time with a significant mean slope growth factor (7.76, $p = .01$) but a non-significant mean quadratic growth factor (-1.82, $p = 0.13$). By the end of follow-up, Class 2 had the highest level of distress. Class 2 comprised 6% ($n = 36$) of the analytic sample. Class 3 was characterized as “high initial distress with improvement.” Class 3 started with the highest mean intercept and the intercept was significantly different from zero (19.09, $p < 0.001$), yet declined significantly over time to a point where final distress levels were comparable to those in the “low distress” Class 1. The significant negative slope growth factor (-14.69, $p < 0.001$) and quadratic growth factor (3.50, $p < 0.001$) indicated this concave effect. Approximately one-tenth (11%, $n = 62$) of YMSM were assigned to Class 3.

The covariates of interest were integrated as predictors of class membership. Results are detailed in Table 4. Class 1, characterized by “low distress,” was set as the reference group, as it had both the largest membership and the lowest levels of distress.

Those with a parental history of depressive symptoms were more likely to be in the “moderate and increasing distress” class (Class 2) (OR = 3.90, $p = 0.02$, 95% CI 1.22 to 12.43). Childhood neglect (OR = 3.12, $p = 0.01$, 95% CI 1.27 to 7.70) and sexual abuse in childhood (OR = 5.31, $p < 0.001$, 95% CI 2.30 to 12.23) were associated with greater odds of membership in the “high distress but substantial decrease” class (Class 3).

Discussion

A three class model with concordant indices of fit, along with empirical and theoretical plausibility, indicated distinct trajectories of psychological distress in YMSM: low distress, moderate and potentially increasing distress, and high but substantially decreasing distress. Taken together, these trajectories indicate heterogeneity in the experiences of YMSM during this period of development. Overall, race/ethnicity was not a significant predictor of class membership, indicating that there may not be differences in psychological distress when comparing the racial/ethnic majority (i.e., White) and racial/ethnic minority YMSM in this sample. Instead, the predictors of class membership were histories of abuse and parental depression – causes for concern that transcend demographics or minority statuses.

Notably, the vast majority of YMSM (83%) appear to have low and stable levels of distress, indicating good psychological health during this period of major life transitions. This aligns with prior evidence that most sexual minority youth are not experiencing a significant level of distress.^{2; 16; 67; 88-90}

With regard to Class 2, the “moderate and increasing distress” group, their initial distress levels were moderate and between the lowest and highest groups (Classes 1 and 3, respectively). Over time, their distress increased somewhat; by the end of three years of follow-up, this class had the highest level of distress. The combination of higher and persistent distress is in stark contrast to the trajectories of their peers, which were either low and stable, or initially high but with substantial improvements. This group is likely in need of ongoing monitoring and intervention. This class may also be at risk for major depression as they continue into young adulthood. The observed persistence of symptoms (e.g., anhedonia, perceived worthlessness) in late adolescence and emerging adulthood may be salient predictors of early adult onset of a major depressive disorder, as mood disorders such as depression tend to emerge in early to middle adulthood.¹³⁴⁻¹³⁷ Earlier onset of these symptoms has also been associated with longer delays in treatment seeking.¹³⁸

Parental history of depressive symptoms was a predictor of membership in this class, and several explanations are possible. First, young men who themselves experience depression or psychological distress may be more “in tune” with depressive symptomatology and thus more likely to recall seeing symptoms in their parents. It is also plausible that this observation reflects the familial patterns of depression, whether behavioral, genetic, environmental, or gene-environment interactions.^{79; 139} This finding has potential clinical relevance, as it appears that parental depression may exacerbate the greater general risk of distress experienced by YMSM. Finally, Class 2 also had greater visual heterogeneity in the observed trajectories, and future research might examine risk and protective factors that might influence improvements or decrements within this group.

Notably, these analyses included specific facets of childhood abuse in addition to parental depression, i.e., neglect, sexual abuse, and social services involvement rather than a single binary item indicating “any adversity” or a summed number of adversities. As Green et al.⁷⁹ note, adversities tend to cluster, necessitating the assessment of a variety of adversities; findings may be misleading if the assessed ACE clusters with other ACEs but is not itself exerting the causal effect. The differentiation used in the present study may help to delineate the specific adversities that predict later distress among these YMSM

Finally, Class 3 experienced much higher levels of initial distress, but improved substantially after baseline. Nearly 10% of the sample fell into this trajectory. This group was also more likely to have experienced childhood adversity (neglect of basic needs, and sexual abuse). This finding has several potential interpretations. First, and most optimistically, this trend may be a manifestation of resilience in YMSM.^{2; 16; 67; 88-90} Prior research has found similar decreases in distress among SMY over a similar time period.⁹² During the period of development captured in this study (emerging adulthood), YMSM may be experiencing greater independence, especially if their family of origin was associated with adversity. We note that sexual minority youth are greater risk for experiencing adversities such as abuse or neglect.^{2; 23; 25} For YMSM who experience these traumas, the association with distress may be limited with time. This interpretation might challenge deficit-oriented perspectives that neglect natural processes of resilience. Further research regarding these potential resiliencies could help to inform intervention development.¹⁴⁰

Other methodological explanations might also account for the trend seen in Class 3. First, reductions in distress might represent regression to the mean. Second, study participation itself may have been an unintended “intervention” for several reasons. Participants had regular biannual contact for three years with a relatively small team of community-based research staff. Men who evidenced crises or suicide ideation during study visits were potentially referred to services, though this was anecdotally rare. Third, there is the potential for reactivity to the study measures, including the measure of distress used in this analysis.

There are also a number of methodological limitations that are relevant to the general findings. First, classes and membership are latent and are not observed characteristics. Ultimately, model selection is subjective, but was based on statistical, pragmatic, and theoretical considerations. Other class solutions are plausible. Achieving model identification and convergence also entailed imposing assumptions. The categorical variables for race/ethnicity and SES were collapsed to binary variables; we were unable to explore differences within racial/ethnic minority groups. Likewise, differences may exist between the collapsed “low” and “middle” familial SES groups. For these analyses, within-class variance was not estimated. While the overall sample variance of the intercept was estimated, it was fixed as equal across the classes; this attenuates across- and within-class heterogeneity in initial distress levels. Further, the slope and quadratic terms had variances fixed at 0, implying no heterogeneity in these growth factors. However, these decisions were made on the grounds of pragmatism and parsimony, and were supported by visual inspection of individual trajectories (i.e., there was great variation in where men started, but their change over time appeared to be more

similar). Along these lines, the intercept, slope, and quadratic growth factors were not regressed on the covariates, and further heterogeneity may exist with regard to the covariates' influence on initial status (intercept) and change (slope, quadratic) within each class. Finally, the confidence intervals for the odds ratios were fairly wide, indicating a level of uncertainty in the precision of these estimates.

In terms of study design, analyses were undertaken with a convenience sample of urban emerging adult YMSM with specific enrollment criteria. Racial/ethnic minority YMSM were oversampled to reflect HIV disparities in NYC. These findings may not be generalizable to other YMSM, including YMSM outside of the NYC context, HIV-positive YMSM, and YMSM enrolled in the military, as these were exclusion criteria. All data were self-reported and are subject to social desirability bias. However, the study used ACASI and computer-based surveys to reduce social desirability bias.¹¹⁴⁻¹¹⁶ These analyses also did not account for potential protective factors (e.g., social support) or treatments (e.g., mental health services) that likely influence mental health, as well as other potential stressors (e.g., victimization, family rejection). The covariates that were included also have limitations that should be noted. First, the measure of perceived familial SES is not a validated measure and asks participants to generalize their familial SES over the relatively extensive period of childhood; fluctuations in SES were possible over this time. Other measures of SES, including objective and more nuanced indicators of childhood SES (e.g., parental occupations, parental education) may yield different findings. Second, the item assessing childhood sexual abuse only references abuse by parents or caregivers, and thus may not capture abuse experiences that were perpetrated by other adults.

Finally, it is plausible that men with high distress were more likely to miss a given follow-up, meaning that data are not missing at random. While this is an imperfect assessment of the missing data mechanism, post-hoc bivariate regression analyses indicated that neither the immediately prior wave nor subsequent wave distress scores predicted missingness at a given wave (p -values = 0.15 to 0.34). Further, dropout after baseline was not associated with baseline distress scores ($p = 0.82$).

This study also has a number of strengths. As noted, the latent trajectory classes are not identified a priori, and instead arise from the data. While standard growth modeling allows variation in the intercept and slope, a single trajectory is estimated for the entire sample.¹²⁸ With LCGA and GMM, multiple trajectories may exist and may aid in the identification of unobserved subgroups of YMSM. Wang et al.¹³⁰ note that unobserved populations within single monolithic populations (as otherwise captured by traditional growth models) may help to explain inconsistencies often documented across studies. More broadly, the longitudinal design allows for a more nuanced perspective of psychological distress in YMSM. By oversampling racial/ethnic minority YMSM, we were able to compare racial/ethnic minority and majority subgroups of YMSM, which has typically not been done with existing representative population samples. Finally, we focused on psychological distress as the outcome of interest, which can help to capture subclinical yet impactful depressive symptomatology.

Conclusions

In summary, the majority of YMSM in this sample have low levels of distress, and those with initially-high levels of distress tended to improve within a relatively short

period of time. However, there was a small but notable trajectory group of YMSM with moderate but persistent psychological distress. These are important findings in light of predominately deficit-centered research on YMSM health, and calls for more attention to trajectories of wellbeing and resilience. We also note that distress in YMSM may be unrelated to their sexual minority status. Adolescence and emerging adulthood, regardless of sexual orientation, entail challenges and potentially stressful developmental experiences.^{57; 86} Being a sexual minority in a heterosexist society can compound this stress.¹¹ Future longitudinal research may also incorporate distal health outcomes as they relate to these trajectories, and test protective factors as predictors of distress trajectories.

Table 1. Sample descriptives**(N = 588).**

| | % (n) |
|---|-------------|
| Race/ethnicity ^a | |
| White | 29.08 (171) |
| Racial/ethnic minority | 70.92 (417) |
| Black | 14.46 (85) |
| Latino | 38.61 (227) |
| API | 4.59 (27) |
| Multiracial/other | 13.27 (78) |
| Perceived familial SES ^b | |
| High | 29.76 (175) |
| Lower/middle | 70.24 (413) |
| Lower | 32.99 (194) |
| Middle | 37.24 (219) |
| Parental history of depressive symptoms | |
| No | 62.59 (368) |
| Yes | 37.41 (220) |
| Adverse childhood experiences | |
| Neglect of basic needs in childhood | 8.84 (52) |
| Touched sexually, as a child | 6.46 (38) |
| Any social services involvement | 17.18 (101) |

^a Collapsed to White, non-White for analysis^b Collapsed to High SES, Lower/Middle SES for analysis

Table 2. Overview of alternative models.

| Model | | log-likelihood | BIC | LMR p-value | BLRT p-value | Entropy |
|-----------------|----------------------------------|----------------|-----------|-------------|--------------|---------|
| 1 class, LCGA | i-q@0 | -8132.831 | 16387.203 | -- | -- | -- |
| 2 class, LCGA | i-q@0 | -6215.534 | 12539.472 | 0.0912 | < 0.001 | 0.880 |
| 3 class, LCGA | i-q@0 | -6113.114 | 12398.400 | 0.1567 | < 0.001 | 0.898 |
| 4 class, LCGA | i-q@0 | -6043.261 | 12322.460 | 0.2807 | < 0.001 | 0.895 |
| 5 class, LCGA*† | i-q@0 | -5988.845 | 12277.397 | 0.2398 | < 0.001 | 0.905 |
| 1 class, GMM | i equal across classes; s-q@0 | -7911.029 | 15949.996 | -- | -- | -- |
| 2 class, GMM | i equal across classes; s-q@0 | -6152.331 | 12419.443 | 0.5986 | < 0.001 | 0.914 |
| 3 class, GMM ‡ | i equal across classes; s-q@0 | -6061.597 | 12301.743 | 0.006 | < 0.001 | 0.903 |
| 4 class, GMM* | i equal across classes; s-q@0 | -6004.860 | 12252.035 | 0.1591 | < 0.001 | 0.922 |
| 5 class, GMM* | i equal across classes; s-q@0 | -5942.379 | 12190.840 | 0.0612 | < 0.001 | 0.884 |

* >1 parameter fixed to avoid singularity of the information matrix.

† Class solution included class with < 1% of the sample.

‡ Candidate model.

Table 3. Class estimates and descriptives.

| | MLR estimates (SE) | | |
|---|--------------------|--------------------|---------------------|
| | Class 1 | Class 2 | Class 3 |
| Posterior probabilities (SE) | 0.973 (0.002) | 0.901 (0.012) | 0.877 (0.011) |
| Intercept – Mean (SE) | 4.045* (0.244) | 10.657* (2.103) | 19.088* (1.104) |
| Intercept – Variance (SE) | 7.064* (1.859) | 7.064* (1.859) | 7.064* (1.859) |
| Slope – Mean (SE) | -0.929* (0.339) | 7.760* (3.264) | -14.692* (1.361) |
| Quadratic - Mean (SE) | 0.217* (0.107) | -1.826 (1.195) | 3.498* (0.404) |
| | % (n) | % (n) | % (n) |
| Proportion of total analytic sample | 83.33 (490) | 6.12 (36) | 10.54 (62) |
| Race/ethnicity | | | |
| White | 41.84 (205) | 44.44 (16) | 27.42 (17) |
| Non-white | 58.16 (285) | 55.56 (20) | 72.58 (45) |
| Perceived familial SES | | | |
| High | 31.84 (156) | 30.56 (11) | 12.90 (8) |
| Lower/middle | 68.16 (334) | 69.44 (25) | 87.10 (54) |
| Parental history of depressive symptoms | 34.29 (168) | 69.44 (25) | 43.55 (27) |
| Childhood adversity | | | |
| Neglect of basic needs in childhood | 6.33 (31) | 13.89 (5) | 25.81 (16) |
| Touched sexually, as a child | 4.29 (21) | 2.78 (1) | 25.81 (16) |
| Any social services involvement | 15.31 (75) | 19.44 (7) | 30.65 (19) |

* p < .05

Table 4. Multinomial logistic regression with covariates.

| | Odds ratio (95% CI) | |
|----------------------------------|------------------------|------------------------|
| | Class 2 | Class 3 |
| High SES | 0.97 (0.31, 3.04) | 0.39 (0.15, 1.0) |
| White race/ethnicity | 1.01 (0.40, 2.54) | 1.02 (0.44, 2.38) |
| Parental depression | 3.90* (1.22, 12.43) | 1.16 (0.57, 2.39) |
| Childhood neglect of basic needs | 2.04 (0.54, 7.68) | 3.12* (1.27, 7.70) |
| Touched sexually, as a child | 0.41 (0.05, 3.62) | 5.31* (2.30, 12.23) |
| Social services involvement | 0.81 (0.32, 2.06) | 1.27 (0.54, 2.98) |

^a Reference class is Class 1

* $p < .05$

Figure 1. Sample means and estimated means, 3 classes.

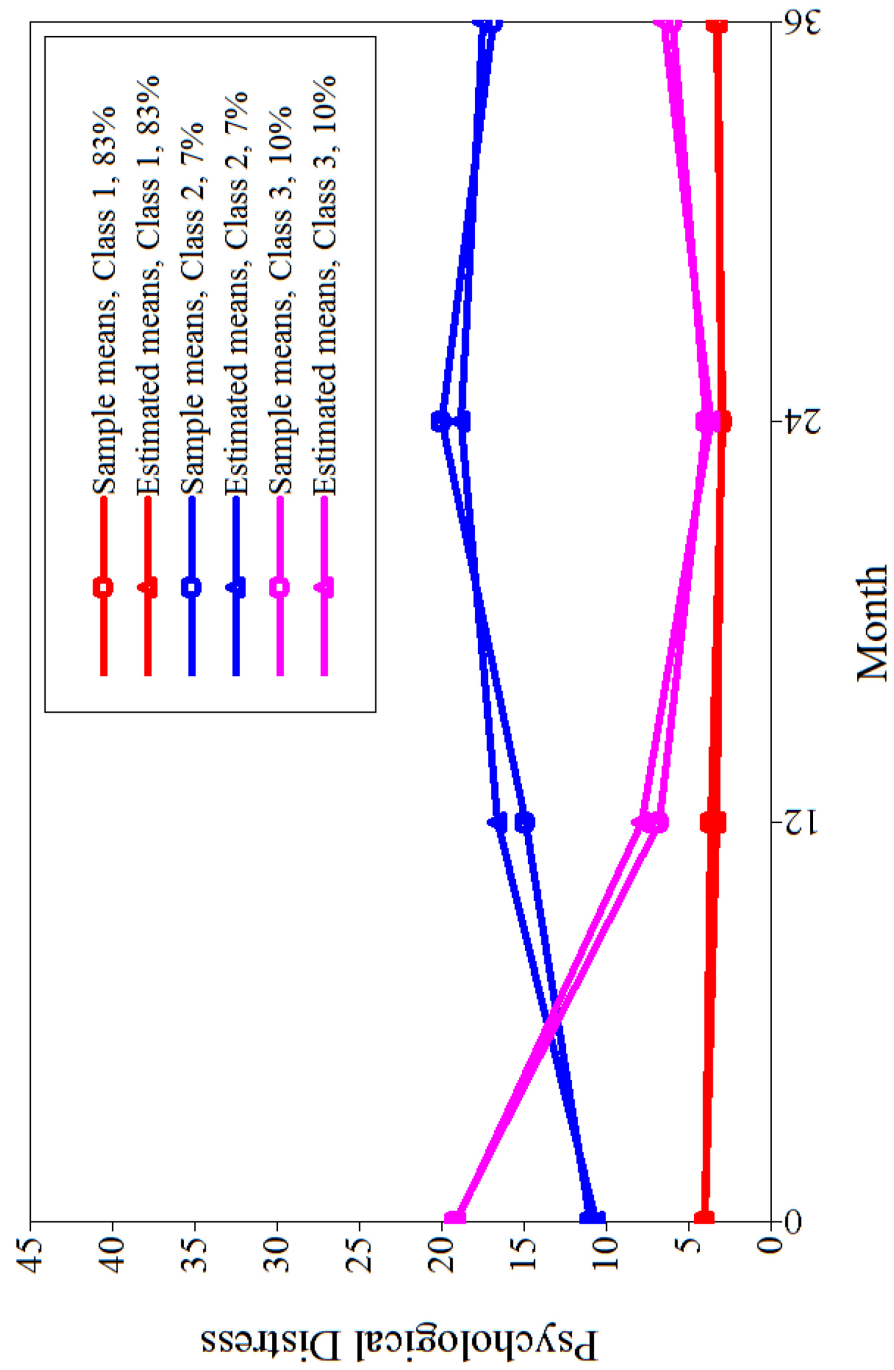


Figure 2. Class 1: Mean trajectory and observed trajectories.

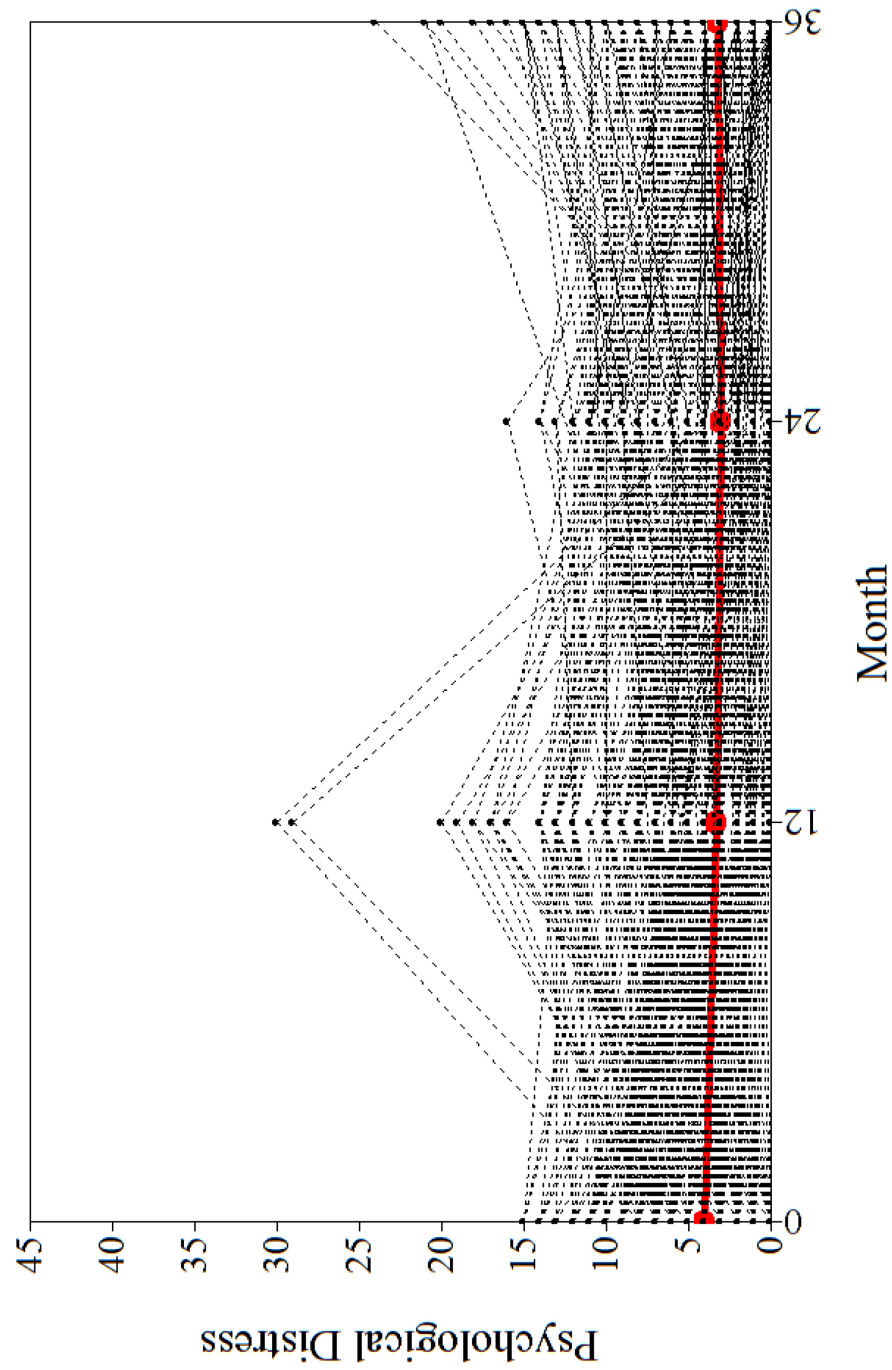


Figure 3. Class 2: Mean trajectory and observed trajectories.

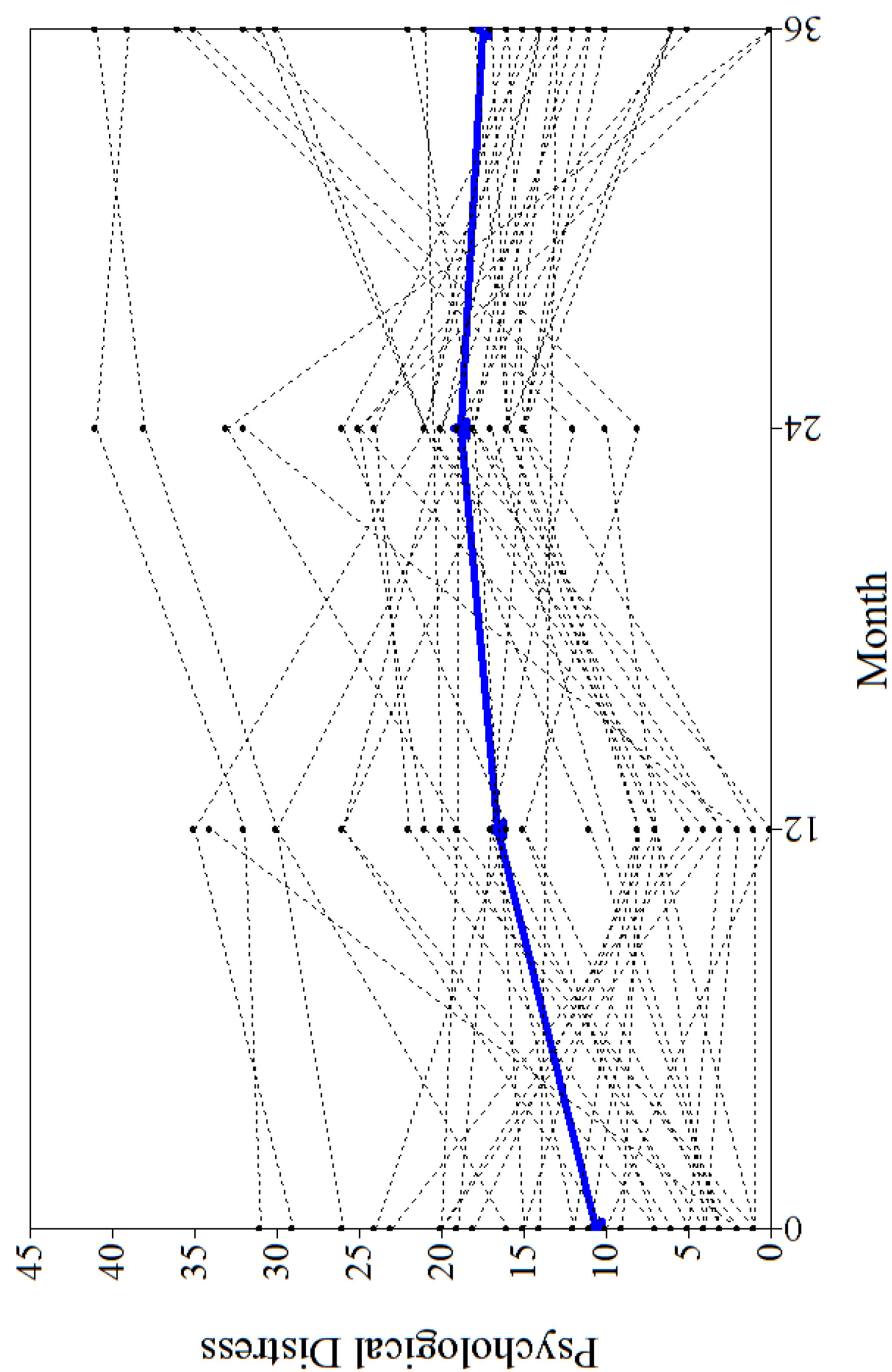
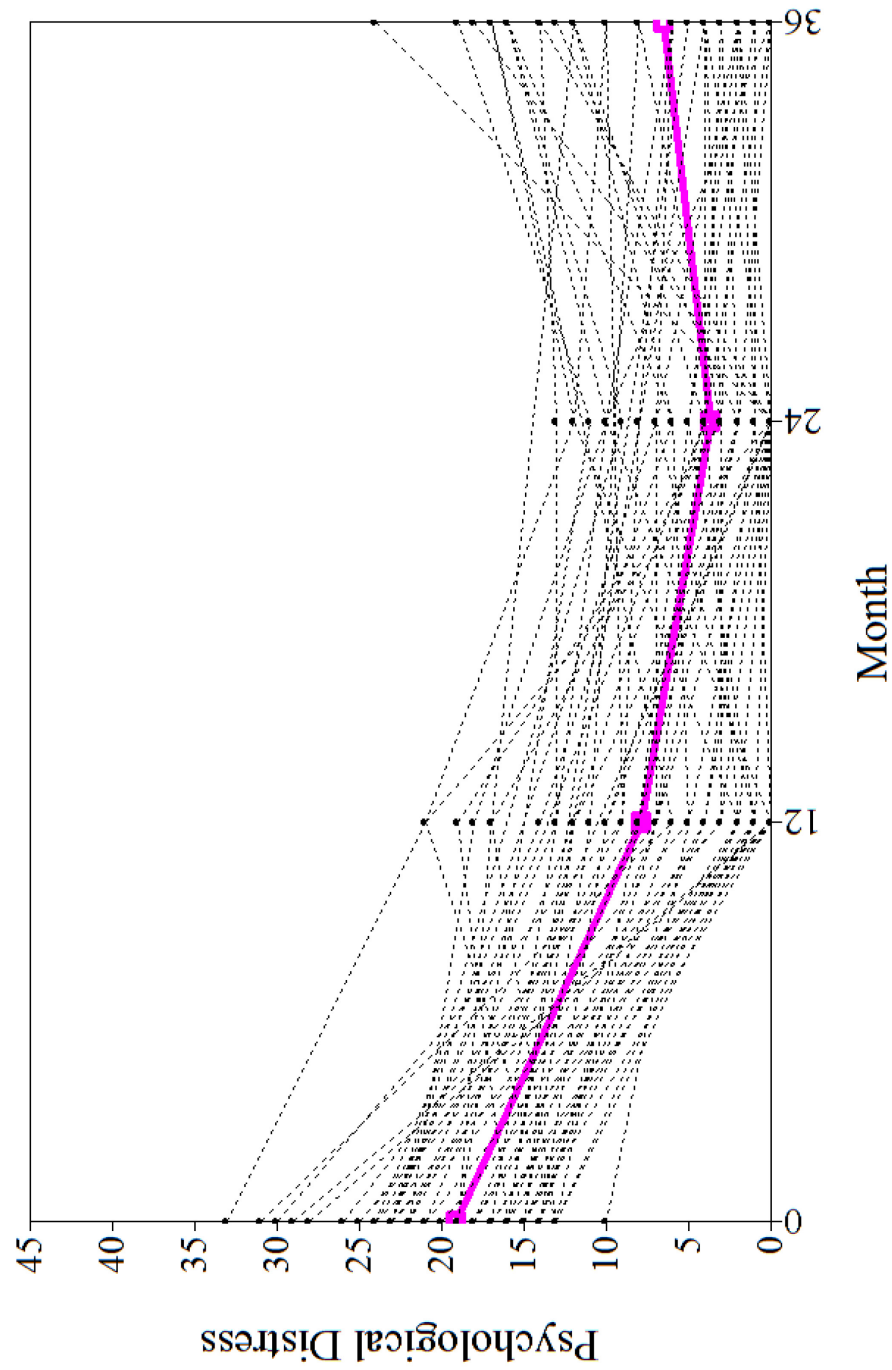


Figure 4. Class 3: Mean trajectory and observed trajectories.



Chapter 4:

Latent Growth Curve Analysis of Internalized Homonegativity in Emerging Adult Young Men Who Have Sex With Men

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Abstract

Purpose: Young men who have sex with men (YMSM) may internalize the overt or covert homophobia they encounter in their social environments. This internalized homonegativity (IH) has implications for mental health, social relationships, and risk behaviors. To date, only a limited body of research has examined differences in IH among YMSM. Additionally, there is a need for longitudinal research that examines changes in IH during the period of emerging adulthood.

Methods: Latent growth curve models were used to examine IH in a sample of 393 YMSM with three years of follow-up. Time-invariant covariates (race/ethnicity, perceived familial socioeconomic status, religion in family of origin) were tested as predictors of growth factors. Time-varying covariates (sexual orientation, school enrollment, being hurt by others' reactions to one's homosexuality, and psychological distress) were tested as predictors of IH over time.

Results: IH was generally low and decreased with time, though there was significant variation in both initial IH level and change over time. Race/ethnicity, familial SES, and religion in the family of origin were not associated with the growth factors. Rather, the time-varying psychosocial covariates had specific relationships with IH at each time point. IH appears to be higher in YMSM who are not exclusively homosexual.

Additionally, the impact of others' negative reactions to homosexuality may attenuate over time. Finally, psychological distress was consistently associated with IH.

Conclusions: States, rather than sociodemographic traits, appear to predict IH in this sample of YMSM. The observed trend indicates low IH overall, and improvements over time for YMSM who do experience IH. There was, however, significant across-individual heterogeneity in IH levels over time. Interventions or programs that seek to affirm and promote healthy sexual identity development should target YMSM who indicate experiences of hurt, rejection, or psychological distress.

Introduction

As sexual minority youth, young men who have sex with men (YMSM) are at risk for poorer mental health than their heterosexual peers.²⁻¹³ A body of research has documented factors at the individual and social levels that impact the mental health of sexual minority youth and factors that mediate the relationship between sexual minority status and mental health. Broadly, these inequities may be attributed to stressors experienced by sexual minority youth, including discrimination, victimization, and other experiences of homophobia^{2; 3; 13; 18; 22; 52; 54; 89; 141} Despite growing acceptance of homosexuality and sexual minorities in the United States,⁴⁷⁻⁴⁹ homophobia and heterosexism have significant influences on the health of sexual minorities.^{2; 50}

These adverse experiences are associated with psychological distress^{3; 16} including depression and suicide behaviors.^{3; 12; 16; 22; 52; 67-69} To guard against overt or covert victimization, youth may suppress, hide, or try to change their sexual orientation, causing further psychological stress.^{13; 22; 54; 57; 66; 142} A potential outcome of these stressors and/or attempts to suppress or hide sexual orientation is internalized homonegativity (IH)². Succinctly, internalized homonegativity arises when YMSM internalize homophobic and heterosexist attitudes.^{2; 22; 54-56}

Health impacts of IH. IH has numerous potential consequences for the health of YMSM. Among sexual minorities, IH has been associated with depression, anxiety or psychological distress.^{50; 56-63} IH is also a potential impediment to healthy sexual identity development and social integration^{16; 22; 57; 64} IH may also further limit supports that

² Internalized homophobia, heterosexism, and homonegativity are often used interchangeably in the literature. Here, I refer to “internalized homonegativity” as a broad term reflecting the negative attitudes and stigma, both overt and covert, which are internalized by some YMSM. See Mayfield, 2001.

would otherwise buffer YMSM during these stressors. Common protective supports and buffers may be absent or limited for YMSM.^{57; 67; 70-72} Specifically, SMY may experience chronic or acute disconnection from peers and family, and institutions such as schools, which are critical to adolescent development and social support.^{11-13; 17; 22; 25; 57; 70; 72-76} Along these lines, higher IH is generally associated with less sexual identity disclosure⁶³ and may impede YMSM from tapping into or developing supportive relationships with peers, family, or mentors. For example, Kapadia et al.¹⁴³ found that higher IH was associated with lower perceived emotional support among YMSM. In a similar vein, YMSM who seek to “pass” (i.e., appear to others) as heterosexual may embody or espouse homophobic attitudes themselves, perpetuating intra-community homonegativity.^{54; 55} IH also has clinical implications, in that sexual minorities with higher IH may be less likely to access or obtain quality care.² IH is also associated with behavioral risks such as truancy, poor school performance, substance use, and sexual risk behavior.⁶⁴⁻⁶⁶ As Radkowsky⁵⁷ notes, IH may be “particularly insidious” and “nonconscious” in youth.

Areas for additional research. YMSM as a population are not a monolith, yet there is a dearth of research examining within-group differences in IH. There is an identified need for research that examines how sexual minorities’ health and life experiences vary across sociodemographics.² Finally, emerging adulthood is a pivotal period of development,¹ and there are gaps in research with regard to longitudinal perspectives on IH among YMSM.

Race/ethnicity. It is plausible that there are differences in IH levels or trajectories across racial and ethnic groups of YMSM. In addition to broader social attitudes toward

sexual minorities, YMSM of color may also experience discrimination and victimization from within their racial/ethnic groups due to specific cultural attitudes toward homosexuality.⁶⁷ Racial/ethnic minority LGBT adults are more likely to report discord between their sexual and orientation and their religion.⁴⁹ Among YMSM, religious family members and the church were prominent sources of homophobia in the lives of Black YMSM.⁵⁴ Recent analyses of General Social Survey data (GSS) found recent declines in negative attitudes toward homosexuality within Black non-Hispanic, Hispanic/Latino, and White non-Hispanic groups,⁴⁷ but Black and Hispanic adults continue to indicate less tolerance for homosexuality.^{47; 99} However, little research has examined whether there are manifest differences in IH levels across race/ethnicity.^{63; 144}

Socioeconomic status. As a fundamental cause of health inequities, socioeconomic status (SES) shapes social contexts, life experiences and health.^{2; 95} Additionally, subjective socioeconomic status is associated with youths' self-rated health and may also reflect self-identity similarly to race and ethnicity.¹⁰³ However, strikingly little research has examined differences in IH by SES or perceived SES. SES might also shape the availability of resources to buffer experiences of discrimination or victimization attributable to sexual orientation or race/ethnicity. As an example of the potential nuances in social contexts shaped by SES, McGarrity et al.¹⁰⁴ found that for lower-SES gay and bisexual men, "outness" about one's sexual orientation was associated with poorer health experiences and discrimination, while this did not hold true for men of higher SES.

Sexual orientation. A large and growing body of research consistently demonstrates that sexual minorities experience health disparities and inequities across

many health conditions.² However, less is known about potential differences in IH within sexual minority subgroups. For example, how do bisexual MSM experience homophobia?¹⁴⁵ Bauermeister et al.¹²² found no differences in IH by Kinsey rating among sexual minority youth, while Shilo et al.⁶⁰ found that bisexual youth reported higher levels of IH than their gay or lesbian peers.

School. The potential relevance of schools to IH is multifaceted. Youth spend a significant proportion of their day in the school environment, and schools are a primary environment where YMSM may experience victimization.^{141; 142; 145; 146} This victimization may contribute to IH, or IH and its associated distress might deleteriously affect school performance. Conversely, schools may exert a protective effect; for example, data indicate that supportive school climates (e.g., with Gay-Straight alliances) are associated with lower risk for suicide behavior.^{24; 147} Yet, YMSM may be less connected to schools and other protective institutions.

To date, the extant literature regarding IH has not incorporated schools as a covariate of interest. Further, the broader body of literature regarding general distress or depression among sexual minorities has typically focused on youth and adolescence, or has grouped those older than 18 with all adults, and/or has examined educational attainment rather than school enrollment. School enrollment during emerging adulthood likely reflects post-secondary or vocational training. This level of education typically engenders additional explorations and sociocultural exposures¹ which might in fact be protective against IH. Additionally, post-secondary school enrollment might also reflect an additional facet of SES.

Religion. Organized religions have varying views on homosexuality, and much has been written about religion as it relates to sexual minorities. Globally, nations characterized by higher religiosity are less accepting of homosexuality.⁴⁸ In the U.S., the vast majority of U.S. LGBT adults in a population-representative survey perceived that major religious groups (e.g., Catholic, Mormon, Christian) were unfriendly to LGBTs; other religions (e.g., Judaism) were at best “neutral” toward LGBTs.⁴⁹ Religion, accordingly, is often positioned as a source of homophobia and potential IH in the lives of YMSM.^{54; 66} For example, Meanley et al.⁸⁴ and Shilo et al.⁶⁰ found that religious involvement was associated with higher IH among LGBT youth. This homophobia may be directly associated with the church (e.g., messages in sermons) or indirectly associated with the church (e.g., religious attitudes of family members).⁶⁶ Further, YMSM can be doubly stressed by the religious guilt associated with lying or hiding their sexual identity or orientation.⁶⁶ Conversely, religion and religious institutions may also be sources of support for YMSM,⁵⁴ and some YMSM have the agency to actively resist or tolerate homophobic messages.^{54; 66}

IH over time. There is a general dearth of quantitative research that prospectively examines IH and the potential heterogeneity in IH trajectories.^{63; 144} In a retrospective analysis of adult MSM, IH generally resolved over time among men in the Multicenter AIDS Cohort Study (MACS), even in an era prior to wider social acceptance of sexual minorities⁸⁸. Notably, the MACS cohort spans several decades with distinct social contexts for sexual minorities; yet, there was no association between the decade (1940s through 1990s) in which MSM realized same-sex attractions and their initial IH levels. The resolution or reduction of IH over time could represent natural developmental

processes and resiliencies within MSM, an important growing area of LGBT health research.^{51; 73; 88}

Present study. The present study seeks to address a number of these calls for further research. Specifically, this analysis uses latent growth curve modeling of IH in a diverse sample of YMSM. IH was modeled over a three-year period of emerging adulthood, with attention to sociodemographics, religion in family of origin, school enrollment, experiences of being hurt by others' reactions to homosexuality, and psychological distress.

Methods

I utilized longitudinal data from a parent study of substance use, sexual risk, and mental health among YMSM who were enrolled at ages 18-19 years old in NYC (N = 600). The study consisted of three years of follow-up, with biannual data collection. The present analysis uses data from the four yearly waves (baseline, Month 12, Month 24, and Month 36).

Participants were recruited and enrolled between May 2009 through July 2011 using convenience sampling methods. Three general approaches were undertaken. First, we used active methods (e.g., recruiters solicited passerby in a predefined venue or public space) and passive methods (e.g., posting of signage) in a variety of venues within the five boroughs of NYC. These included gay-identified (e.g., dance clubs) and non-gay identified (e.g., college campuses, public parks) venues. Additionally, enrolled participants were offered an incentive to refer up to two peers to the study (peers underwent the same eligibility screening process). Third, we used gay-identified and non-

gay-identified social networking sites for Internet-based recruitment. We oversampled YMSM of color in order to reflect underlying HIV disparities among YMSM.

Recruitment targets were established so that two-thirds of the sample were non-white YMSM.

Participants were eligible if they were 18-19 years old, were of biologically male sex, self-reported to be HIV-negative or did not know their serostatus, resided in the New York City metropolitan area, and reported having sexual contact with another man in the prior 6 months. Men who were currently enlisted in the military were not eligible.

Additionally, pre-enrollment refusal to undertake urine-based drug metabolite screenings (randomized to 50%) or rapid HIV antibody screenings (all participants, unless confirmed seropositive) were grounds for ineligibility. A total of 2,068 men were screened over the two year enrollment period, with ineligibility primarily due to age >19 years old.

Before enrollment, a trained staff member obtained signed informed consent from all participants. The study protocol was approved by the Institutional Review Board at New York University. We obtained a Certificate of Confidentiality to protect the research participants and their data, given the sensitive nature of the study. Remuneration was escalated at each follow-up to reduce attrition. Remuneration for the follow-ups analyzed in this paper included \$35 (baseline), \$45 (Month 12), \$65 (Month 24) and \$100 (Month 36). Data were collected using audio computer-assisted interview software (ACASI) or using an internet-based survey program for participants who relocated after the baseline assessment.

Outcome variable. The outcome of interest was internalized homonegativity (IH). The study used a 4-item IH scale from the Young Men's Survey, as reported in Thiede et

al.¹²⁵ The four items included, “Sometimes I dislike myself for being gay or bisexual,” “I feel stress and conflict within myself over having sex with men,” “Sometimes I wish I was not gay or bisexual,” and “I sometimes feel guilty after having sex with men.” Men responded on a 5-point Likert-type scale, ranging from “strongly disagree” to “strongly agree.” Responses were summed to create a total score, which could range from 0 to 16. The measure had good reliability at each wave ($\alpha = 0.85-0.89$) in this analytic subsample.

Independent variables. Time-invariant covariates included race/ethnicity, perceived familial SES, and religion in family of origin. Time-invariant covariates were assessed once, at baseline. Race and ethnicity were assessed and collapsed to categories of Black non-Hispanic, White non-Hispanic, Asian American/Pacific Islander [API] non-Hispanic, and multiracial/other. Perceived familial SES was assessed with a single item (“What do you perceive to be the economic class of the people who raised you?”), with responses of “lower,” “lower middle,” “middle,” “upper middle,” and “upper” For analysis, responses were collapsed into a categories of lower, middle, and upper familial SES.

Religion in family of origin was assessed with a single item (“In what religious affiliation were you raised?”). Because several categories had insufficient cell sizes (e.g., Hindu, $n = 2$), responses were collapsed into categories of none/atheist/agnostic, Jewish, Catholic, other Christian, Protestant, Baptist, and Other for analysis.

Time-varying covariates were assessed at each yearly wave of follow-up. School enrollment was assessed with a single binary item. Sexual orientation was assessed on the 7-point Kinsey scale¹²⁰ ranging from “exclusively heterosexual” to “exclusively homosexual” and was collapsed to “exclusively homosexual” versus “not exclusively

homosexual.” Psychosocial distress was measured with 15 cognitive-affective items (e.g., sadness, self-dislike, anhedonia) from the Beck Depression Inventory-II [BDI-II].¹²¹ The BDI-II has been used successfully with SMY and has demonstrated good reliability.^{13; 122} The BDI-II cognitive-affective subscale had good reliability at each wave ($\alpha = 0.89-0.93$) in this analytic subsample. Finally, being hurt by others’ reactions to one’s homosexuality was assessed with a single item (“I have been hurt by how people have reacted to learning I’m gay.”) Participants responded on a 4-point Likert-type scale, which was collapsed to a binary variable of “agree” or “disagree” for analysis.

Analytic Plan. First, the sample was characterized using descriptive statistics with regard to sociodemographics, IH, and the time-varying covariates. Then, IH over time was modeled using latent growth curve modeling (LGCM). LGCM is a form of longitudinal modeling that can capture heterogeneity in change over time with regard to inter-individual and intra-individual differences.¹⁴⁸ Marginal longitudinal models would lose this heterogeneity, or model it as noise rather than meaningful information about across-individual variations.

In LGCM, the latent growth factors consist of the intercept factor (i.e. initial status), slope factor (i.e., change from initial status, over time), and potentially a quadratic factor (i.e., curve or flattening of the slope over time). These growth factors are then regressed as dependent variables on the covariates of interest (e.g., sociodemographics), which are conceptualized as exogenous predictors of the growth factors. The time-varying covariates (e.g., psychological distress) are independent variables for the outcome of interest (i.e., IH) at each respective wave. For example, IH at baseline is regressed on the time-varying covariates as observed at baseline. By modeling

each time point separately, the relationship between the time varying-covariates and the outcome can vary across time points.¹⁴⁸ Thus, in the final model, the covariates of interest predict the latent growth factors while controlling for the time-varying covariates.¹⁴⁸

Models were created in an iterative process, starting with a simple, unconditional growth model (i.e., without covariates). Then, covariates were added in three sequential models incorporating race/ethnicity, perceived familial SES, and religion in family of origin. Finally, the time-varying covariates (school enrollment, being hurt by other's reactions to homosexuality, exclusively-homosexual orientation, and psychological distress) were added simultaneously in the fifth and final model. All models were estimated using maximum likelihood with robust standard errors (MLR). Model fit was assessed using several fit indices with generally-accepted cutoffs to indicate acceptable or good fit, or improvements in fit: AIC, BIC, RMSEA (< 0.06), CFI (> 0.95), TLI (> 0.95), and SRMR (< 0.08).¹⁴⁹⁻¹⁵⁵ The present analysis used complete cases, $n = 393$ of the parent study's $N = 600$ sample. Imputation was not undertaken, given the unknown missing data mechanism, the time-varying nature of multiple covariates, and thus the complications of such estimation. The present sample size was sufficient for quadratic growth curve modeling with four waves.¹⁵⁶

Results

The analytic sample characteristics are detailed in Table 1 (time-invariant variables) and Table 2 (time-varying variables). Overall, the analytic sample was approximately 70% non-White ($n = 276$). Perceived familial SES was somewhat evenly

distributed across the three strata, although there were slightly more men reporting middle SES (40%, $n = 156$). The most common religion in family of origin was Catholicism (45%, $n = 177$), followed by other Christian denominations (19%, $n = 75$).

IH was highest at baseline ($M = 4.3$, $SD = 4.12$), and had the largest drop between baseline and Month 12 ($M = 2.8$, $SD = 3.64$). By Month 36, the mean IH score was 2.5 ($SD = 3.3$). At each of the four assessments, 30% ($n = 116$), 47% ($n = 184$), 48% ($n = 187$) and 50% ($n = 195$) of the men had a score of 0. Though IH mean scores were generally low, there was a wide range in IH scores at each follow-up (ranges = 0 to 16, 0 to 16, 0 to 15, and 0 to 14, respectively, and interquartile ranges (IQR) were similarly wide (14, 12, 15, and 12, respectively).

Psychological distress levels were highest at baseline ($M = 6.13$) and decreased over time. Throughout the study period, the majority of the sample was enrolled in school. At baseline, 88% ($n = 345$) were enrolled in school; by Month 36, 58% ($n = 229$) were enrolled in school. Overall, approximately half of the sample endorsed an “exclusively homosexual” orientation, although this proportion increased somewhat from baseline (44%, $n = 173$) to Month 36 (52%, $n = 205$). Finally, the proportion of men who reported being hurt by others’ reactions to homosexuality decreased substantially from baseline (41%, $n = 162$) to Month 12 (28%, $n = 110$). At remaining follow-ups, approximately a quarter of YMSM reported being hurt by others’ reactions.

Here, I delineate results for three of the models. These include the unconditional model (Model 1), the model with all time-invariant covariates (Model 4) and the final model with both time-invariant and time-varying covariates (Model 5). An overview of all five model results is provided in Table 3.

For the unconditional model (Model 1), a model with a quadratic term provided a better fit to the data than a linear-only model (not shown), as indicated by RMSEA, CFI, TLI and SRMR fit statistics, as well as visual inspection of the mean response. Additionally, the mean of the quadratic growth factor was significantly different from zero ($p < 0.001$). Thus, a quadratic growth factor was included to correctly specify all subsequent models. The outcome variable (IH) at the final observation (Month 36) evidenced a small, non-significant negative residual variance (-0.26, $p = 0.90$). To correct for this violation, the variance for this variable was fixed at 0 in subsequent models. In latent growth curve modeling, this practice is acceptable when the variance is both small and non-significant.

In the unconditional model (Model 1), the intercept (4.21, $p < .001$) was significantly different from zero, and indicated significant across-individual variance (11.11, $p < .001$). Additionally, the slope factor was significantly different from zero (-1.47, $p < .001$) but its variance was not significantly different across individuals. The quadratic growth factor was significantly different from zero (0.29, $p < .001$) and significantly varied across individuals (0.37, $p = .03$). None of the growth factors had significant covariance, indicating that initial status was not associated with rate or curvature of change.

In the model with all time-invariant covariates (Model 4), the mean intercept (3.37, $p < 0.001$) and slope were (-1.53, $p = 0.01$) significantly different from zero. There was also significant across-individual variation for the intercept (10.91, $p < 0.001$) and quadratic (0.34, $p = 0.04$) growth factors. There were no significant covariances in the

growth factors. Race/ethnicity, familial SES, and religion in family of origin were not significantly associated with differences in any of the growth factors.

The final model (Model 5), with time-invariant covariates as well as time-varying covariates, evidenced good overall fit and some improvement in fit over previous models, as indicated by AIC, BIC, RMSEA, CFI, TLI, and SRMR. Model 5 is detailed in Table 4. The intercept remained significantly different from zero (2.99, $p < 0.001$) with significant across-individual variability (8.62, $p < 0.001$). The slope also remained significantly different from zero (-1.87, $p = 0.03$) although without significant across-individual variance. Conversely, the variance of the quadratic factor was significant (0.34, $p = 0.01$) although the overall mean of the quadratic term was not significantly different from zero. There were no significant covariances in the growth factors, indicating that initial status was not associated with rate or curvature of change. Race/ethnicity, familial SES, and religion in family of origin were not significantly associated with any of the growth factors.

With regard to the time-varying covariates, at baseline, those with an exclusively homosexual orientation tended to have lower IH (-1.42, $p < 0.001$), while psychological distress (0.13, $p < 0.001$) and being hurt by others (0.85, $p = 0.01$) were associated with greater IH. Similar results emerged for Month 12, where exclusively homosexual orientation (-1.09, $p < 0.001$) was associated with lower IH, while psychological distress (0.17, $p < 0.001$) and being hurt by others (1.03, $p = 0.001$) were associated with greater IH. At Month 24, exclusively homosexual orientation (-0.69 $p = 0.003$) was associated with lower IH, and psychological distress predicted greater IH (0.19, $p < .001$). Being hurt by others was associated with higher IH, though with marginal statistical

significance (0.62, $p = 0.05$). At Month 36, exclusively homosexual orientation (-0.76, $p = 0.002$) was associated with lower IH, and psychological distress predicted greater IH (0.14, $p < 0.001$).

Discussion

These analyses sought to explore longitudinal trends in IH among emerging adult YMSM, examining potential differences in IH across racial/ethnic groups, familial SES, and religion in family of origin. The model also incorporated psychological distress, sexual orientation, school enrollment, and experiences of being hurt by others' reactions as factors that might be associated with IH over time. The average level of IH was low in this sample; mean scores declined from 4.3 at baseline to 2.5 by the conclusion of three years of follow-up. Yet, there was substantial range in IH scores throughout the follow-up period. Interestingly, IH, psychological distress, and experiences of being hurt by others' reactions all decreased substantially in the first year of follow-up. As will be discussed later, this potentially reflects developmental processes related to both emerging adulthood and sexual identity development.

In the final model, YMSM on average had a low but statistically significant initial level of IH, and there was a decrease in the average IH score over time. However, there was significant spread in YMSM's individual initial IH level. While there was not evidence of quadratic curvature in the average IH trend, individuals still had significant variation around the sample's average quadratic score (i.e., while the overall mean was not different from zero, there was still significant spread across individuals' quadratic estimates). This observed variance could reflect differences across YMSM in how their

IH over time curved upward, curved downward, or flattened over time. As a summary of the final model, YMSM typically began with a low level of IH that decreased over time. On average, there was not significant curvature or flattening in the level of IH, but individual YMSM had different curvature or flattening in their IH over time. While it is not possible to make quantitative comparisons to other studies (due to inconsistencies in measurement), this finding is in line with the general evidence that most SMY are not severely distressed and evidence good mental health.^{2; 10; 16; 51; 67; 73; 88-90; 111}

Across all time points, men with “exclusively homosexual” orientation had lower IH. Notably, the magnitude of this relationship decreased substantially over time. At baseline, the coefficient was 1.4; by the final wave, its effect was nearly halved to 0.8. It is possible that the attenuation in the association between IH and sexual orientation reflects the “coming out” process of development and maturation of sexual orientation and identity over time. A prior analysis with this sample found that YMSM increasingly identified as “exclusively homosexual” over the first 18 months of the parent study.¹⁵⁷ This trend echoes prior findings that IH decreases with greater sexual identity development.^{158; 159} Succinctly, IH is higher earlier in “coming out” processes.⁶³ Further, as one’s sexual orientation shifts, his experiences in the social environment may accordingly shift. For example, men with “exclusively homosexual” orientations may be more engaged in gay communities with implicit or explicit affirmation of homosexual orientation or gay identity. However, it is important to note that there are nuances of sexual identity development (e.g., identity development, identity integration, and psychosocial factors that influence these processes) that are beyond the scope of the present analysis.¹⁶⁰ Additionally, the directionality of this relationship cannot be inferred

here. Reactivity to the measures of sexual orientation and IH might also partly explain this shift over time. YMSM with lower IH may be less ambivalent about endorsing an “exclusively homosexual” orientation compared to YMSM with greater IH.

Interestingly, the association between being hurt by others and IH disappeared with time. Though being hurt by others was a significant predictor of IH scores at baseline and Month 12, it was only of marginal statistical significance at Month 24, and no longer significant by Month 36. A number of processes might explain this sequence, including differential affiliation, psychological development, potential resiliencies, and historical changes in social attitudes. First, as men matured during this period, they likely also experienced increasing autonomy and choice (psychological, financial, and geospatial) in their social relationships and environments.¹ That is, with increasing age, these men create chosen families⁵⁴ and may interact less with family or peers who have responded negatively. Additionally, the psychological impact of hurtful initial coming out experiences may diminish with time. Still, the effects of being hurt may be long-lasting for some YMSM; Puckett et al.¹⁴⁴ found that (typically years later) internalized homonegativity and social support mediated the relationship between rejection by one’s parents and current mental health problems. In the present study, the dispersal of this covariate’s significance may also reflect underlying developmental resiliencies in these young men^{22; 88; 89} in that others’ reactions have less salience for men as they transition into young adults. Finally, this trend may represent social changes in the environment. These data were collected over a period of time in which LGBT youth mental health, high profile suicides, and high-visibility social marketing campaigns (e.g., The ‘It Gets Better’ Project^{TM161}) garnered mainstream attention. As such, it is plausible that broader

social attitudes shifted (i.e., family or peers in these men's lives became less outwardly homophobic), and/or that these exogenous events cultivated a sense of resiliency within YMSM. However, it is also important to note that prior research has found reductions in IH over time in MSM, even prior to an era of growing acceptance of sexual minorities.⁸⁸ Likewise, a meta-analysis of IH studies did not find evidence of a historical effect with regard to the relationship between IH and mental health.⁵⁰

In contrast with the diminishing effects of others' reactions, the relationship between psychological distress and IH remained fairly constant across waves in terms of magnitude and statistical significance. Prior research has documented associations between IH and depression or distress.^{3; 12; 16; 22; 52; 67-69} The present study cannot determine the directionality of this relationship, but future research might model potential pathways. Future research might also explore whether factors that predict IH and distress vary across the life course.

Finally, several covariates were consistently not associated with IH. School enrollment status was not a significant predictor of IH. As such, the risk and protective aspects of school may have washed out each other, or schools may not be relevant to IH in this sample of NYC YMSM. The majority of YMSM were enrolled in school over most of the study's duration, and there may be insufficient variability in school enrollment. Future research might integrate more nuanced measures of school enrollment (e.g., type of post-secondary school), school attachment, and school performance.

Notably, race/ethnicity, familial SES, and religion in family of origin were not associated with IH in this sample. However, the variable for race/ethnicity was time-invariant and relatively reductive, and other aspects of race/ethnicity (e.g., racial identity

salience) might predict IH differently. Along these lines, it is important to caution that this analysis examined religion in family of origin, yet these men may have disconnected or distanced themselves from their religious roots, or they may have reconfigured their relationship with a religion, spiritual practice or belief, or a given deity.⁶⁶ We also did not measure the intensity of family religiosity, which could moderate the salience of religious attitudes toward homosexuality.

While this sample may not be generalizable to all YMSM, these findings suggest that interventions or programs that seek to affirm and promote healthy sexual identity development should target YMSM who indicate experiences of hurt, rejection, or psychological distress (regardless of whether these are antecedents or outcomes of IH). These psychosocial factors are potential markers of distress in YMSM. Despite evidence of population-level differences in attitudes toward homosexuality, crude sociodemographic categories are poor criteria for IH risk in this sample. States, rather than sociodemographic traits, appear to predict IH.

Limitations. The present study has a number of limitations that warrant consideration. First, analyses were undertaken with a convenience sample that entailed specific enrollment criteria that might not be generalizable to other YMSM (e.g., YMSM enrolled in the military, YMSM who were HIV-positive at the time of eligibility screening). Men in this sample initially resided in New York City, and the majority continued to reside in NYC throughout the duration of the study. Thus, the men in this sample may have had access to sexual minority-supportive resources, services, and communities that may not exist in other geographic regions or outside of major metropolitan areas.

Further, men with higher IH may have been less likely to participate, or continue participation, in a study with an explicitly-stated purpose of studying YMSM health. In terms of missingness, the present analysis used complete case analysis, which again may limit the representativeness or generalizability of these findings. To characterize potential differences in observed variables, I conducted post-hoc analyses using analysis of variance or chi-square tests where appropriate, to test for differences between the full parent study sample and this paper's analytic subsample. There were no significant differences between the two groups with regard to race/ethnicity, perceived familial SES, and religion in family of origin. There were several specific differences at given waves. First, IH scores at Month 12 were lower among men who were included in this analysis ($M = 2.82$ versus $M = 4.05$, $p = 0.03$), as were psychological distress scores at Month 12 ($M = 4.49$ versus $M = 5.88$, $p = 0.04$) and Month 36 ($M = 4.19$ versus $M = 5.73$, $p = 0.04$). At baseline, a slightly higher proportion of analytic subsample members were currently enrolled in school (87.79% versus 81.46%, $p = 0.04$). Finally, a greater proportion of men in the analytic sample were exclusively homosexual at Month 12 (49.87% versus 33.95%, $p = 0.003$) and Month 24 (50.90% versus 37.86%, $p = 0.02$). In summary, mean IH scores differed by 1.2 at one wave, and distress scores differed by approximately 1.5 at two of the waves when comparing the analytic sample to the full sample. The analytic sample was also more likely to have been enrolled in school at baseline, and was more likely to be exclusively homosexual at two waves. While these observed differences between the analytic subsample and the full sample have statistical significance, the small practical magnitude of differences is of limited significance.

Finally, other mechanisms may explain the decreases in IH noted in this sample. As mentioned earlier, it is plausible that exogenous factors in the social environment (e.g., The ‘It Gets Better’ Project^{TM161}) are threats to internal validity. Additionally, the decrease in IH may represent regression to the mean. There are also other relevant factors that might shape IH trajectories; for example, I did not assess protective factors such as social support, or risk factors such as family rejection. There is also the potential for reactivity to the repeated administration of measures, particularly the measure of IH and psychological distress. The variable assessing religion in family of origin was collapsed due to small sizes; this may have oversimplified within- and across-religion heterogeneity in practices and beliefs. Additionally, religion is multifaceted and the variable for religious affiliation does not reflect these other aspects, such family religiosity.

There are also a number of limitations that may be counterbalanced by strengths. All data were self-reported, and thus susceptible to social desirability bias. However, the study used ACASI and computer-based surveys in order to reduce this bias.¹¹⁴⁻¹¹⁶ Second, the measure of internalized homonegativity lacks extensive psychometric validation, although it has demonstrated high reliability with this sample, has good face validity, and assesses domains of internalized homonegativity (e.g., wishing to be heterosexual, feeling guilt over having sex with men) that broadly reflect other established measures of internalized homonegativity. The present scale consists of four succinct, first-person, self-reflective items, which is a potential strength. Other established measures of IH have included potentially less valid assessments of IH, such as questions that assess one’s perceptions of public attitudes toward homosexuality.^{63; 162} Perceived familial SES was assessed using a single item that has not been validated. However, measuring SES, as a

social construct, is inherently imperfect and should be tailored for the population and topic of study.¹¹⁸ This single item may minimize measurement error (e.g., youth misreporting parents' or caregivers' income, occupation, or educational attainment), and also allowed us to assess perceived SES, which is relevant given the associations between social positions and health.^{103; 119}

Finally, varying language was used by the measures. For example, the item assessing whether men were hurt by others' reactions attributed this to being "gay," while not all men in this sample are gay-identified. However, it is reasonable to assume that most participants would understand the intent of the question despite its imperfections in wording. Additional design strengths of the study include the longitudinal design with repeated measures in a time of critical development, as well as the sociodemographic diversity of the sample.

Conclusions

Notably, the majority of the sample indicated low levels of IH, and IH generally decreased with time over this developmental period of three years. There was heterogeneity in both the baseline levels and changes in IH among YMSM, with some YMSM evidencing substantially higher levels of IH. Differences in IH levels were not related to demographics. Rather, psychosocial variables were more relevant to IH over time. These findings have potential relevance for intervention. First, psychological distress and being negatively affected by others' reactions to homosexuality are psychosocial factors that cut across sociodemographic groups. Because of the inherently stigmatic nature of IH, YMSM may not outwardly manifest the homonegativity they have

internalized. Instead, sexual minority youth struggling with IH might manifest general psychological distress, potentially in tandem with reports of being hurt by or rejected by important others (e.g., family, peers). Service providers and clinicians who work with YMSM should be attuned to these indicators of potential IH. Second, the salience of others' reactions as a predictor of IH diminished with time, suggesting that if YMSM can endure the more challenging periods in emerging adulthood, they ultimately can thrive. Incidentally, this appears to be a core sentiment in countless "It Gets Better" Project^{TM161} testimonials, suggesting that this trajectory a common experience for sexual minorities across age, gender, or orientation. This by no means suggests that YMSM should "just grin and bear it" through victimization, discrimination, and rejection. We still must address the underlying social and structural causes of IH.¹⁴⁶

For YMSM who do experience IH, these reductions over time point to potential avenues for future research. For example, what are the nuances of how bisexual or non-exclusively homosexual YMSM develop and experience IH? Additionally, given the significance of youth and young adult experiences on health across the life course, future research might also explore associations between IH trajectories and early adult health outcomes.

Table 1. Time-invariant sample descriptives.

(N = 393).

| | % (n) |
|------------------------------|-------------|
| Race/ethnicity | |
| Black | 14.76 (58) |
| Latino | 37.66 (148) |
| Asian / Pacific Islander | 6.11 (24) |
| Multiracial / other | 11.70 (46) |
| White | 29.77 (117) |
| Familial SES | |
| Low | 31.04 (122) |
| Middle | 39.69 (156) |
| Upper | 29.26 (115) |
| Religion in family of origin | |
| None, atheist, or agnostic | 11.45 (45) |
| Jewish | 5.85 (23) |
| Catholic | 45.04 (177) |
| Other Christian | 19.08 (75) |
| Protestant | 4.83 (19) |
| Baptist | 9.67 (38) |
| Other | 4.07 (16) |

Table 2. Time-varying sample descriptives and covariates.**(N = 393).**

| | Mean (SD) | | | |
|------------------------------------|-----------------|-----------------|-----------------|-----------------|
| | Baseline | Month 12 | Month 24 | Month 36 |
| Internalized homonegativity | 4.30 (4.12) | 2.82 (3.64) | 2.69 (3.69) | 2.45 (3.32) |
| Psychological distress | 6.13 (6.53) | 4.78 (6.04) | 4.13 (5.81) | 4.47 (6.30) |
| Age | 18.78 (0.54) | 19.81 (0.55) | 20.80 (0.54) | 21.78 (0.58) |
| | % (n) | | | |
| | Baseline | Month 12 | Month 24 | Month 36 |
| School enrollment | 87.79 (345) | 82.19 (323) | 73.03 (287) | 58.27 (229) |
| Exclusively homosexual orientation | 44.02 (173) | 49.87 (196) | 50.89 (200) | 52.16 (205) |
| Hurt by others' reactions | 41.22 (162) | 27.99 (110) | 21.63 (85) | 24.94 (98) |

Table 3. Summary of MLR estimates for Models 1-5.**(N = 393).**

| MLR estimates: b | | | | | |
|---|---------|---------|---------|---------|---------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| Intercept | 4.21* | 4.04* | 4.24* | 3.37* | 2.99* |
| Variance | 11.11* | 11.15* | 11.09* | 10.91* | 8.62* |
| Slope | -1.47* | -1.59* | -1.62* | -1.53* | -1.87* |
| Variance | 4.05 | 4.15 | 4.14 | 3.77 | 3.65 |
| Quadratic | 0.29* | 0.35* | 0.35* | 0.31 | 0.46 |
| Variance | 0.37* | 0.36* | 0.36* | 0.34* | 0.34* |
| Intercept & Slope covariance | -2.36 | -2.54 | -2.52 | -2.35 | -2.50 |
| Intercept and Quadratic covariance | 0.17 | 0.22 | 0.21 | 0.17 | 0.30 |
| Slope and Quadratic covariance | -1.02 | -1.03 | -1.02 | -0.93 | -0.94 |
| Intercept growth factor | | | | | |
| Race/ethnicity ^a | | | | | |
| Black | | 0.63 | 0.53 | 0.38 | 0.40 |
| Hispanic/Latino | | -0.09 | -0.10 | -0.24 | -0.29 |
| Asian / Pacific Islander | | 0.87 | 0.83 | 1.36 | 0.99 |
| Multiracial / other | | 0.45 | 0.43 | 0.52 | 0.22 |
| Familial SES ^b | | | | | |
| Low | | | 0.25 | 0.13 | -0.26 |
| Middle | | | -0.61 | -0.69 | -0.58 |
| Religion in family of origin ^c | | | | | |
| Jewish | | | | 1.10 | 0.41 |
| Catholic | | | | 1.30 | 0.79 |
| Other Christian | | | | 0.67 | 0.23 |
| Protestant | | | | 0.03 | -0.22 |
| Baptist | | | | 1.86 | 1.20 |
| Other | | | | 0.24 | -0.14 |
| Slope growth factor | | | | | |
| Race/ethnicity ^a | | | | | |
| Black | | -0.30 | -0.08 | 0.15 | 0.23 |
| Hispanic/Latino | | 0.14 | 0.27 | 0.65 | 0.41 |
| Asian / Pacific Islander | | 0.57 | 0.65 | 0.33 | 0.65 |
| Multiracial / other | | 0.71 | 0.81 | 0.78 | 0.54 |
| Familial SES ^b | | | | | |
| Low | | | -0.57 | -0.36 | 0.19 |
| Middle | | | 0.26 | 0.45 | 0.63 |
| Religion in family of origin ^c | | | | | |
| Jewish | | | | 1.11 | 1.16 |
| Catholic | | | | -0.91 | -0.63 |
| Other Christian | | | | 0.18 | 0.30 |
| Protestant | | | | 0.77 | 0.51 |
| Baptist | | | | -1.42 | -0.96 |
| Other | | | | 0.82 | 0.88 |

| | | | | | |
|---|---------|---------|---------|---------|---------|
| Quadratic growth factor | | | | | |
| Race/ethnicity ^a | | | | | |
| Black | 0.09 | 0.03 | -0.07 | -0.10 | |
| Hispanic/Latino | -0.05 | -0.05 | -0.18 | -0.11 | |
| Asian / Pacific Islander | -0.26 | -0.28 | -0.21 | -0.25 | |
| Multiracial / other | -0.29 | -0.32 | -0.34 | -0.22 | |
| Familial SES ^b | | | | | |
| Low | | 0.16 | 0.11 | -0.06 | |
| Middle | | -0.07 | -0.11 | -0.18 | |
| Religion in family of origin ^c | | | | | |
| Jewish | | | -0.31 | -0.31 | |
| Catholic | | | 0.23 | 0.20 | |
| Other Christian | | | 0.02 | 0.04 | |
| Protestant | | | -0.10 | -0.004 | |
| Baptist | | | 0.41 | 0.33 | |
| Other | | | -0.15 | -0.13 | |
| IH at Baseline | | | | | |
| School enrollment | | | | | 0.70 |
| Exclusively homosexual orientation | | | | | -1.42* |
| Psychological distress | | | | | 0.13* |
| Hurt by others' reactions | | | | | 0.85* |
| IH at Month 12 | | | | | |
| School enrollment | | | | | 0.19 |
| Exclusively homosexual orientation | | | | | -1.09* |
| Psychological distress | | | | | 0.17* |
| Hurt by others' reactions | | | | | 1.03* |
| IH at Month 24 | | | | | |
| School enrollment | | | | | 0.45 |
| Exclusively homosexual orientation | | | | | -0.69* |
| Psychological distress | | | | | 0.19* |
| Hurt by others' reactions | | | | | 0.62 |
| IH at Month 36 | | | | | |
| School enrollment | | | | | -0.26 |
| Exclusively homosexual orientation | | | | | -0.76* |
| Psychological distress | | | | | 0.14* |
| Hurt by others' reactions | | | | | 0.45 |
| AIC | 7934.71 | 7949.49 | 7956.26 | 7969.93 | 7798.30 |
| BIC | 7982.39 | 8044.86 | 8075.47 | 8160.67 | 8052.62 |
| RMSEA | 0.084 | 0.055 | 0.051 | 0.043 | 0.033 |
| CFI | 0.985 | 0.986 | 0.985 | 0.982 | 0.964 |
| TLI | 0.954 | 0.948 | 0.942 | 0.930 | 0.931 |
| SRMR | 0.024 | 0.016 | 0.015 | 0.011 | 0.031 |
| χ^2 | 7.588 | 13.070* | 16.201* | 24.154* | 88.899* |

* p < .05

^a Reference group is White

^b Reference group is upper SES

^c Reference group is "atheist, agnostic, or none"

Table 4. Model 5, final model with time-invariant and time-varying covariates.
(N = 393).

| | MLR estimates | | | |
|---|---------------|------|---------|--------------|
| | b | S.E. | p | 95% CI |
| Intercept | 2.99* | 0.79 | < 0.001 | 1.44, 4.54 |
| Variance | 8.62* | 2.02 | < 0.001 | 4.65, 12.59 |
| Slope | -1.87* | 0.88 | 0.03 | -3.60, -0.15 |
| Variance | 3.65 | 2.29 | 0.11 | -0.82, 8.13 |
| Quadratic | 0.46 | 0.25 | 0.07 | -0.03, 0.96 |
| Variance | 0.34* | 0.14 | 0.01 | 0.08, 0.61 |
| Intercept & Slope covariance | -2.50 | 2.17 | 0.25 | -6.76, 1.76 |
| Intercept and Quadratic covariance | 0.30 | 0.52 | 0.57 | -0.72, 1.32 |
| Slope and Quadratic covariance | -0.94 | 0.54 | 0.08 | -2.00, 0.12 |
| Intercept growth factor | | | | |
| Race/ethnicity ^a | | | | |
| Black | 0.40 | 0.77 | 0.60 | -1.11, 1.91 |
| Hispanic/Latino | -0.29 | 0.48 | 0.54 | -1.23, 0.64 |
| API | 0.99 | 0.99 | 0.31 | -0.94, 2.93 |
| Multiracial/other | 0.22 | 0.76 | 0.29 | -1.26, 1.70 |
| Familial SES ^b | | | | |
| Low | -0.26 | | | |
| Low | -0.58 | 0.55 | 0.64 | -1.34, 0.82 |
| Middle | | 0.49 | 0.23 | -1.54, 0.37 |
| Religion in family of origin ^c | | | | |
| Jewish | 0.41 | | | |
| Jewish | 0.79 | 0.92 | 0.66 | -1.41, 2.22 |
| Catholic | 0.23 | 0.62 | 0.21 | -0.44, 2.01 |
| Other Christian | -0.22 | 0.71 | 0.75 | -1.16, 1.61 |
| Protestant | 1.20 | 0.99 | 0.83 | -2.15, 1.72 |
| Baptist | -0.14 | 0.98 | 0.22 | -0.72, 3.12 |
| Other | 0.40 | 1.13 | 0.90 | -2.36, 2.08 |
| Slope growth factor | | | | |
| Race/ethnicity ^a | | | | |
| Black | 0.23 | 0.74 | 0.76 | -1.23, 1.68 |
| Hispanic/Latino | 0.41 | 0.52 | 0.43 | -0.61, 1.43 |
| API | 0.65 | 0.99 | 0.51 | -1.29, 2.59 |
| Multiracial/other | 0.54 | 0.70 | 0.44 | -0.84, 1.92 |
| Familial SES ^b | | | | |
| Low | 0.19 | | | |
| Low | 0.63 | 0.56 | 0.74 | -0.08, 1.28 |
| Middle | | 0.48 | 0.19 | -0.31, 1.58 |
| Religion in family of origin ^c | | | | |
| Jewish | 1.16 | | | |
| Jewish | -0.63 | 1.02 | 0.25 | -0.83, 3.15 |
| Catholic | 0.30 | 0.65 | 0.33 | -1.91, 0.64 |
| Other Christian | 0.51 | 0.72 | 0.68 | -1.12, 1.72 |
| Protestant | -0.96 | 0.82 | 0.53 | -1.10, 2.12 |
| Baptist | 0.88 | 0.99 | 0.34 | -2.91, 0.99 |
| Other | 0.23 | 1.09 | 0.42 | -1.25, 3.01 |

| | | | | |
|---|--------|-------|---------|--------------|
| Quadratic growth factor | | | | |
| Race/ethnicity ^a | | | | |
| Black | -0.10 | 0.21 | 0.64 | -0.50, 0.31 |
| Hispanic/Latino | -0.11 | 0.15 | 0.45 | -0.40, 0.18 |
| API | -0.25 | 0.29 | 0.40 | -0.83, 0.33 |
| Multiracial/other | -0.22 | 0.19 | 0.27 | -0.60, 0.16 |
| Familial SES ^b | | | | |
| Low | -0.06 | 0.15 | 0.71 | -0.35, 0.24 |
| Middle | -0.18 | 0.14 | 0.18 | -0.44, 0.08 |
| Religion in family of origin ^c | | | | |
| Jewish | -0.31 | 0.31 | 0.30 | -0.91, 0.28 |
| Catholic | 0.20 | 0.18 | 0.26 | -0.15, 0.55 |
| Other Christian | 0.04 | 0.20 | 0.85 | -0.34, 0.42 |
| Protestant | -0.00 | 0.24 | 0.99 | -0.47, 0.46 |
| Baptist | 0.33 | 0.29 | 0.24 | -0.23, 0.89 |
| Other | -0.13 | 0.36 | 0.72 | -0.83, 0.58 |
| IH at Baseline | | | | |
| School enrollment | 0.68 | 0.46 | 0.14 | -0.22, 1.58 |
| Exclusively homosexual orientation | -1.42* | 0.34 | < 0.001 | -2.09, -0.74 |
| Psychological distress | 0.13* | 0.023 | < 0.001 | 0.07, 0.18 |
| Hurt by others' reactions | 0.85* | 0.34 | 0.01 | 0.17, 1.52 |
| IH at Month 12 | | | | |
| School enrollment | 0.19 | 0.31 | 0.53 | -0.41, 0.79 |
| Exclusively homosexual orientation | -1.09* | 0.24 | < 0.001 | -1.56, -0.63 |
| Psychological distress | 0.17* | 0.03 | < 0.001 | 0.11, 0.22 |
| Hurt by others' reactions | 1.03* | 0.32 | 0.001 | 0.40, 1.66 |
| IH at Month 24 | | | | |
| School enrollment | 0.45 | 0.25 | 0.08 | -0.05, 0.94 |
| Exclusively homosexual orientation | -0.69* | 0.23 | 0.003 | -1.14, -0.24 |
| Psychological distress | 0.19* | 0.03 | < 0.001 | 0.13, 0.25 |
| Hurt by others' reactions | 0.62* | 0.31 | 0.048 | 0.01, 1.24 |
| IH at Month 36 | | | | |
| School enrollment | -0.26 | 0.25 | 0.31 | -0.75, 0.24 |
| Exclusively homosexual orientation | -0.76* | 0.25 | 0.002 | -1.24, -0.28 |
| Psychological distress | 0.14* | 0.03 | < 0.001 | 0.08, 0.20 |
| Hurt by others' reactions | 0.45 | 0.30 | 0.13 | -0.13, 1.03 |

* p < .05

^a Reference group is White

^b Reference group is upper SES

^c Reference group is "atheist, agnostic, or none"

Figure 1. Observed sample mean vs. estimated mean – final model, Model 5.

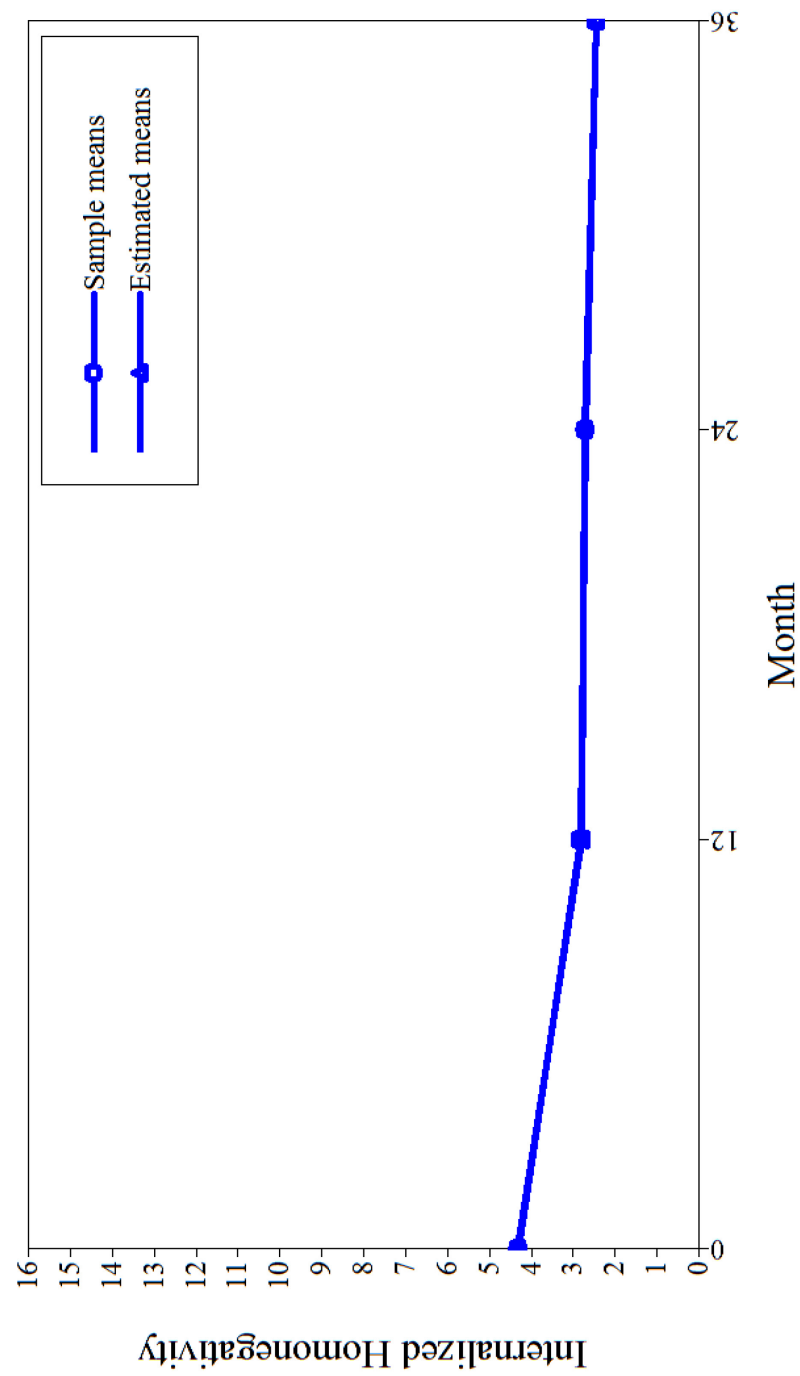
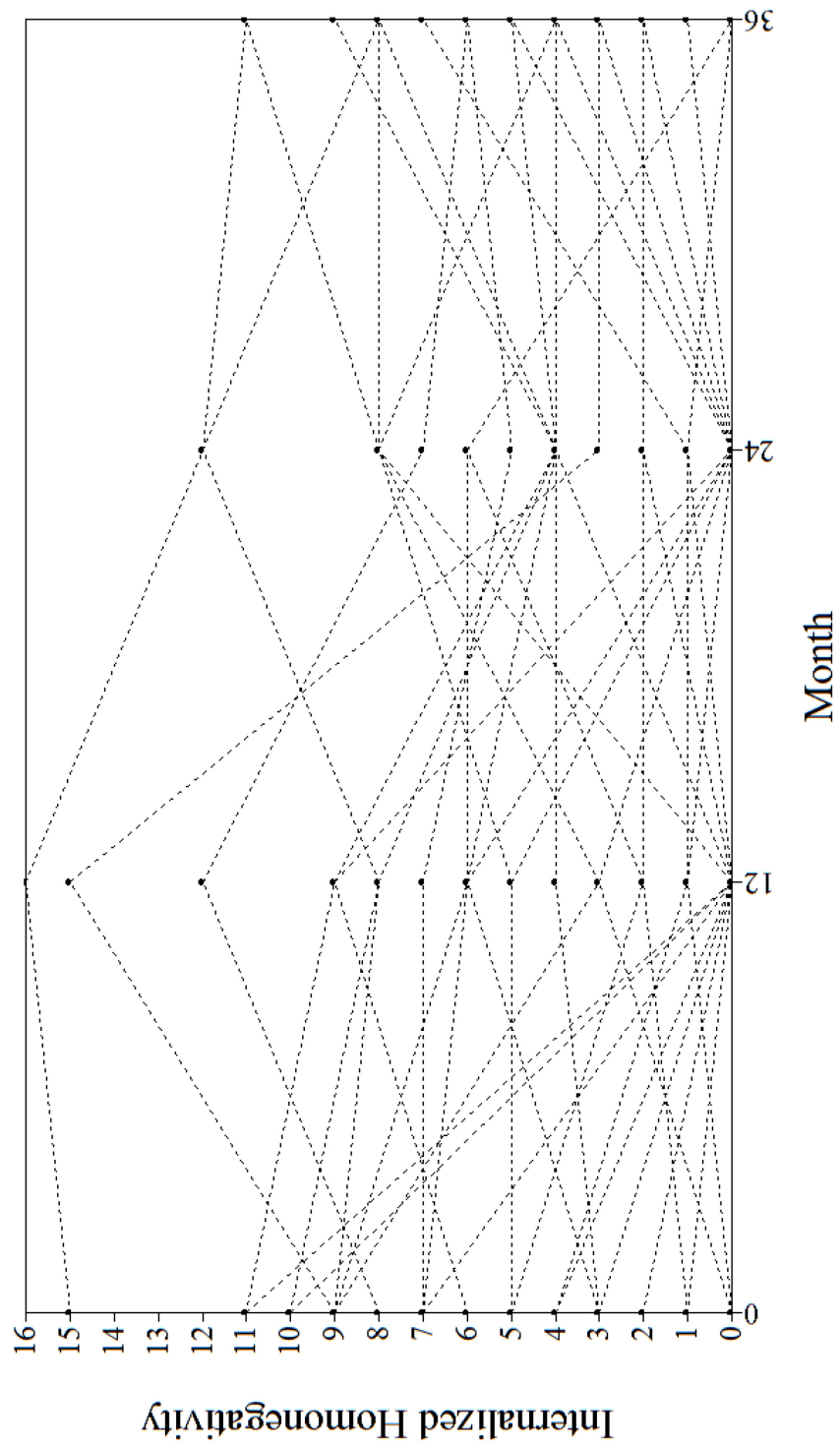


Figure 2. Graph of $n = 39$ (i.e., 10%) randomly-selected observations.



Chapter 5:

A Longitudinal Analysis of Suicide Ideation in Emerging Adult Young Men Who Have Sex With Men

Chapter 5: A Longitudinal Analysis of Suicide Ideation in Emerging Adult Men Who Have Sex With Men

Abstract

Purpose: These analyses sought to address several gaps in the literature regarding suicide behavior among young men who have sex with men (YMSM). There is a demonstrated need for research that 1) prospectively examines suicide behaviors, 2) focuses on the developmental period of emerging adulthood, and 3) identifies YMSM at greatest risk for suicide behavior. To accomplish these aims, I tested whether sociodemographic characteristics, adverse childhood experiences, psychosocial states, exposures to others' suicide behaviors, school enrollment, and health care variables were associated with suicide ideation (SI) among YMSM.

Methods: I examined the prevalence of SI and related behaviors (suicide attempts, medically-serious attempts) over a period of three years in a cohort of racially/ethnically diverse emerging adult YMSM (N = 600). Generalized estimating equations (GEE) were used to model past-year SI with the independent variables of interest (race/ethnicity, perceived familial SES, sexual orientation, adverse childhood experiences, psychological distress and internalized homonegativity, health care insurance and utilization of mental health treatment, and exposure to others' suicide attempts).

Results: A quarter (26%) of YMSM reported SI at least once during the study period. Among men who ever reported ideation during the three years, one-third attempted suicide, and one-third of these men had medically-serious injuries as a result. Prevalence

of SI was highest at baseline (17%), and decreased over time. Having experienced childhood neglect (AOR = 2.12), knowledge of a friend's recent suicide attempt (AOR = 1.78), and higher psychological distress scores (AOR = 1.15) predicted greater odds of SI. As age increased, the odds of SI decreased (AOR = 0.73).

Conclusions: While the majority of YMSM did not experience SI, there is a subset of YMSM who are at greater risk than their peers. This risk was associated with psychosocial factors, and there were not differences in SI across sociodemographic categories. Clinical and research implications are discussed.

Introduction

Existing comparative research indicates that sexual minority youth (SMY) experience higher rates of suicide behaviors (i.e., ideation, planning, attempts) than their heterosexual peers.^{3; 4; 7; 8; 15-27} Further, there is evidence that as the severity of suicide behaviors increases (e.g., planning, attempts, attempts requiring medical treatment), the difference in prevalence between SMY and heterosexual youth widens further.⁸ These findings are in line with mental health inequities documented among SMY more generally.²⁻¹⁴

Lifetime history of suicide behavior among male SMY has been estimated at 28%.⁸ Similar rates exist with regard to past-year ideation (25%), planning (22%) and attempts (21%) among male SMY in pooled data from 2005 and 2007 Youth Risk Behavior Surveys (YRBS).⁴ These disparities become quite evident when contrasting SMY to their heterosexual peers in this YRBS sample, where past-year prevalence of ideation (9%), planning (8%) and attempts (5%) were significantly lower.⁴ These inequities have also been identified among adult men who have sex with men (MSM), who are more likely to have experienced suicide ideation and attempts (40%-55% lifetime prevalence) than heterosexual men (8% to 25% lifetime prevalence).²⁷ In comparison, a systematic review of literature published between 1997 and 2007 reported that 6% to 14% of the general U.S. adult population have ever experienced suicide ideation, and among adolescents, 12% report ever experiencing suicide ideation.³⁹

In the following sections, I first review the psychosocial factors relevant to suicide behaviors among SMY and young men who have sex with men (YMSM),

followed by a review of general psychosocial factors associated with suicide behaviors irrespective of sexual orientation, yet with important nuances relevant to SMY and YMSM. I also summarize what is known regarding the prevalence of suicide behaviors across sociodemographic groups. After summarizing the existing gaps in research, I conclude by presenting the impetus for longitudinal analyses of suicide ideation among emerging adult YMSM. These analyses focus on suicide ideation among emerging adult YMSM; however, the structure of existing literature necessitates a review that more broadly incorporates the existing evidence regarding 1) SMY more generally, 2) suicide behaviors more generally (i.e., ideation, plans, or attempts) and 3) the developmental periods of adolescence and young adulthood. Where possible, specificity is provided regarding study populations or measured outcomes.

Psychosocial factors relevant to SMY and YMSM. Nothing inherent to the lives of SMY and YMSM explains these striking disparities in suicide behaviors. Rather, it is well documented that sexual minorities of all ages face individual- or structural-level victimization and discrimination in the social environment.^{2; 3; 13; 18; 22; 51-53} Among SMY and YMSM, the observed disparities in suicide behavior prevalence are commonly attributed to discrimination and victimization (e.g., bullying by peers) as well as the psychological distress associated with these experiences.^{2; 3; 8; 16; 17; 38; 57; 67; 163} There is strong evidence regarding the relationship between indicators of psychological distress and suicide behaviors in youth and adults, as well as SMY specifically.^{8; 10; 21; 37-42}

Additionally, unaccepting families may spurn or abandon SMY and YMSM, and the link between family rejection and suicide risk behavior cannot be understated.^{38; 41; 75;}

¹⁶⁴ For example, Ryan et al.⁷⁵ found that among White and Latino SMY with the greatest

levels of family rejection, the odds of current depression (as indicated by CES-D scores) increased 6-fold, and the odds of a lifetime suicide attempt increased 8-fold. Conversely, family support or acceptance is associated with reduced likelihood of suicide behaviors. For example, Eisenberg et al.⁷⁰ found that higher levels of family connectedness halved the odds of lifetime suicide ideation and suicide attempts among male SMY.

Internalized homonegativity. Internalized homonegativity may contribute directly or indirectly to disproportionate suicide behaviors observed among SMY and YMSM. Briefly, internalized homonegativity (IH) arises when an individual internalizes homophobic and heterosexist attitudes they encounter in the social environment.^{2; 22; 54-57} IH impacts the health of YMSM, in that it is associated with psychological distress, negative impacts on sexual identity development, hindered social integration and support, and intra-community homophobia.^{16; 22; 50; 56-64} Accordingly, internalized homonegativity may both co-occur with, and reinforce psychological distress experienced by YMSM,¹⁸ and further impede social support¹⁴³ and thus might help to explain variations in the prevalence of suicide behaviors among YMSM. Additionally, IH may inhibit sexual minorities' utilization of quality health care² which could hamper YMSM's utilization of mental health care.

Psychosocial factors relevant to youth, adolescents, and young adults. In addition to sexual minority-specific risk factors, there are a number of other factors that are more generally associated with suicide behaviors, such as developmental stressors, adverse childhood experiences, psychological distress or depression, and exposures to others' suicide behaviors. Further, these "general" psychosocial factors have nuances and details relevant to SMY and YMSM that warrant consideration.

Developmental transitions in emerging adulthood. Young men, irrespective of sexual orientation, experience psychosocial changes inherent to adolescence and emerging adulthood, and these periods entail potentially stressful events and transitions.^{57; 76; 86} For example, in adolescence and emerging adulthood, individuals undertake exploration and experience increasing autonomy, identity development, changes in living arrangements and geographic location, transitions into careers and/or higher education, and changes in relationships (e.g., familial, romantic).¹ Additionally, the brain continues to mature during adolescence and young adulthood and the neurobiological developments and changes during this period occur in structures of the brain and processes that are relevant to cognition and executive functioning, emotional regulation, decision making, and impulse control.^{165; 166} Along these lines, psychiatric disorders such as major depression typically have onset during adolescence and early adulthood^{135; 137} and relatedly, onset and peaks of suicide behavior occurs during these periods.³⁹ Taken together, these biological and psychosocial processes denote that emerging adulthood as a high-risk period for suicide behaviors.

However, the overwhelming majority of literature exploring suicide behavior among SMY or YMSM has focused on youth or adolescence and has not explored the longitudinal changes in suicide behavior over the period of emerging adulthood. Data indicate that SMY and their heterosexual peers generally experience decreases in distress and suicide behavior as adolescence and young adulthood progress.^{7; 15; 92; 93} However, like the literature demonstrating SMY disparities in mental health more generally, the available data on longitudinal suicide behavior patterns are largely comparative (i.e., sexual minorities compared to heterosexuals). Much less is known regarding changes in

the prevalence of suicide behaviors over time within sexual minority subpopulations, including YMSM, and there is a need for additional longitudinal research in this area.^{7; 8; 38; 93}

Childhood adversity. Adverse childhood experiences (ACEs) can spur a “cascade” of biopsychosocial risks,²⁵ and adversities such as physical, sexual, and emotional abuse, neglect, and parental psychopathology tend to cluster.⁸¹ ACEs have well-documented implications for mental health across the life course^{25; 78; 79; 82; 167} including greater risk for suicide behaviors among young adults and adults.^{41; 43; 80} In addition to these links demonstrated in the general population, these associations have also been documented among sexual minorities. For example, Friedman et al.⁷¹ found that a history of childhood physical abuse was associated with a nearly twofold increase in the odds of a suicide attempt as an adult.⁷¹ More proximally within young adulthood, mediation analyses of data from the National Longitudinal Study of Adolescent to Adult Health indicated that ACEs explained 11% of excess risk for suicide behavior (ideation and/or attempts) among gay and lesbian young adults.²⁵ While the psychosocial sequelae of ACEs appear to cut across sexual orientation, data suggest that SMY may disproportionately experience ACEs such as abuse or homelessness^{2; 23; 25} potentially elevating their risk for psychiatric problems that are associated with suicide risk.

Exposure to peer and family suicide behavior. Existing literature generally indicates that having knowledge or exposure to others’ suicide attempts or completions is associated with one’s own increased risk for suicide behaviors.⁴³ In a review of published findings on youth and adolescents specifically, Spirito et al.²¹ note conflicting published evidence regarding links between exposures to peer suicide behavior and one’s own

suicide behavior.²¹ These conflicting findings may be attributable to the specific peer suicide behavior assessed by the study, i.e., ideation versus attempts. In a case-control study of adolescents who were exposed to a peer's completed suicide, this exposure was not associated with an adolescent's own attempts; rather, exposed adolescents were more likely to experience onset of major depression, anxiety disorder, and PTSD.¹⁶⁸ Further, while exposed adolescents were more likely to report ideation, this ideation was overwhelmingly explained by the onset of depression following the exposure to the completed suicide.¹⁶⁹ While not quantitatively significant, exposed adolescents explained that "their friend's suicide had an inhibitory effect on future suicide behavior, because they saw the terrible devastation experienced by friends and family alike" (p. 651).¹⁶⁸ Other research suggests that exposures to peer's attempts, more so than completed suicides, is associated with adolescents' own ideation or attempts;^{42; 170} however, this finding may be partly attributable to the relative infrequency of completed suicides.⁴²

Researchers have hypothesized mechanisms that underlie associations between peer suicide behaviors and youths', adolescents', or young adults' own suicide risk behaviors. These include role modeling of suicide risk behaviors, differential affiliation by individuals with behaviors or characteristics that also dovetail with suicide risk (e.g., substance use), or the existence of social groups that share underlying common stressors or acutely stressful experiences.^{44; 170; 171} This latter explanation might be particularly salient for SMY and YMSM, given their shared susceptibility to discrimination or victimization as minorities. Finally, given that SMY and YMSM generally report higher rates of suicide behavior, they are in turn more likely to be exposed to peers' attempts or completions, potentially engendering a within-group feedback loop.

There is also evidence that suicide behavior among family members is associated with elevated risk for suicide behaviors among youth and adolescents generally,^{21; 41; 42; 44} and among SMY more specifically.¹⁰ With regard to underlying mechanisms, role modeling and psychiatric disorders are an insufficient explanation for within-family suicide risk.¹⁷² Instead, data from family genetic studies, twin studies, and adoption studies concur that suicide behaviors are heritable and transmitted within families, independent of psychiatric disorders.^{21; 44; 172} This within-family transmission has been posited to occur via neurobiological influences (e.g., the serotonergic system), transmission of impulsive and aggressive personality traits, parental psychopathology, family dysfunction, ACEs, and complex interactions thereof.^{21; 44; 172} Taken together, the available evidence suggests that genetics, environment, and gene-environment interactions underlie familial transmission of suicide behaviors. Additionally, the loss of a parent to suicide is itself a stressor that can engender suicide risk.¹⁷²

School enrollment. With regard to suicide behaviors, schools may be characterized as environments of risk (e.g., bullying), environments with protective relationships (e.g., social connection, mentorship), or as environments where distress manifests (e.g., academic disengagement). First, a significant proportion of the bullying experienced by adolescents takes place in the school environment^{141; 142; 145; 146; 173} Conversely, school climates that support SMY and YMSM (e.g., with Gay/Straight alliances) are associated with lower risk for suicide behaviors.^{24; 147} Youth who are at greater risk for suicide behaviors may be less likely to be enrolled in school,⁴ and school absenteeism is also a potential indicator of distress.¹⁷⁴ School engagement may also reflect or influence future mental health trajectories. Among SMY in the National

Longitudinal Study of Adolescent to Adult Health, Watson et al.¹⁷⁵ found that youth who are disengaged in school were more likely to report suicide attempts or ideation in late adolescence and young adulthood. However, the majority of published research has focused on SMY youth and adolescents (rather than emerging adults or young adults). As a result, the literature is implicitly focused on the pre-college environment. The present study focuses on emerging adult YMSM, and it is plausible that the associations between school enrollment and SI or distress differ in the post-secondary (e.g., college) environment. In line with exploration and increasing autonomy in emerging adulthood¹ participation in higher education might have protective associations against SI. Prior cross-sectional analyses in this sample of YMSM found that school non-enrollment was associated with both higher levels of depression and greater odds of a past-year suicide attempt.¹⁰¹

Mental health care. Access to mental health care is a critical issue for youth nationally,¹⁷⁶ and there is evidence of unmet service need among SMY.^{23; 29} Recent changes to health care access in the United States (i.e., The Affordable Care Act) will confer better access and financial coverage for mental health care. However, the availability of culturally-competent health care for sexual minorities remains a critical issue.² Continuity of care is also important during the transitional periods between adolescence and emerging adulthood; as YMSM “age out” of school-based or youth-only services, they must begin to navigate the “adult” health care system. In a review of the literature, Hawton et al.⁴⁴ identified continuity of mental health care during transitional periods as a crucial challenge for self-harm and suicide prevention among at-risk individuals.

Sociodemographic categories. Sociodemographic categories such as race, ethnicity, and socioeconomic status (SES) are markers for potential inequalities in resources, risk exposures, and health, and thus might be associated with differences in risk for SI among YMSM.^{2; 4; 18; 22; 67; 95; 103} Among the adolescent and young adult general population in the United States, there are racial and ethnic differences in the prevalence of suicide behaviors. Data from the 2013 YRBS indicate that Hispanic adolescents (19%) had the highest prevalence of past-year ideation, followed by White adolescents (16%) and finally Black adolescents (15%). However, these differences may be driven by females in these racial and ethnic groups, who have substantially higher rates of ideation (i.e., 26%, 21% and 19%, respectively) than their male peers; rates among males in each of these racial/ethnic groups (12%, 11%, and 10%, respectively) appear to be more similar across groups.¹⁷⁷ Similar differences by race/ethnicity group were found in the National Comorbidity Survey Replication Adolescent Supplement, where Non-Hispanic Black adolescents were less likely to report lifetime ideation and lifetime attempts than their non-Hispanic White peers. No difference was found between Hispanic adolescents and non-Hispanic White adolescents.⁴⁰ Reviews of the literature also indicate that that Native American and White males have significantly higher rates of completed suicides than other groups.^{21; 39}

With regard to SES, experiencing childhood or youth poverty is associated with negative health and mental health impacts.^{92; 102; 178} SES might also facilitate or hinder access to mental health care. In addition to the more direct influences that SES has on health, Goodman et al.¹⁰³ found that perceived SES is also a relevant predictor of health among adolescents. However, a systematic review of adolescent studies did not identify

SES-based differences.⁴² Yet, a review of international studies from predominantly high income countries demonstrated recurring associations between economic disadvantage and suicide attempt prevalence.¹⁷⁹

SMY and YMSM populations. Despite evidence of racial and ethnic differences in rates of suicide behaviors within the general adolescent and young adult population, much less is known regarding racial or ethnic differences in SI among SMY and YMSM. Using 2005 and 2007 YRBS data, Bostwick et al.⁴ found that Asian and Black SMY were less likely than White SMY to report past-year suicide ideation, though Alaskan Native/PI and Latino SMY were more likely to have attempted suicide. However, sex-stratified analysis did not find any racial/ethnic differences among male SMY with regard to either suicide behavior in the past year.⁴ As noted earlier with regard to more recent YRBS data (2013), the finding of racial/ethnic differences in mixed-sex analysis might be attributable to higher prevalence of suicide behaviors among females. Perhaps most relevant to the present analysis, recent analyses by Burns et al.²⁸ found that among urban YMSM, Black YMSM were less likely to report lifetime suicide ideation than White YMSM, but youth of “other” race/ethnicity (non-Black, Hispanic/Latino, or White) were more likely to have attempted suicide than White YMSM.

To date, existing studies consist of predominantly White samples and there is limited research on racial/ethnic differences in SMY and YMSM mental health.^{4; 16; 27; 38; 97; 98} The large-scale or population representative surveys that indicate mental health disparities among YMSM or SMY have often examined a single “sexual minority” group without additional stratification by race or ethnicity, and this is a major gap in the research across sexual minority health issues. For example, YMSM who experience

racial or ethnic discrimination may have additive stress in line with the minority stress model.^{18; 67} That is, YMSM of color might experience multiple forms of stigma or victimization attributed to multiple minority identities.^{4; 67} Additionally, cultural differences associated with racial and ethnic groups can exert direct or indirect influences on suicide. Factors such as household size, family connectedness, individualism and collectivism, religious attitudes, and the cultural meanings of both antecedent stressors and suicide behaviors may vary across groups.^{4; 180} For example, in developing the Cultural Model of Suicide, Chu et al.¹⁸⁰ note that “[I]n a culture where suicide is viewed as an acceptable and honorable way to relieve one’s family of burden, the threshold for a suicidal act may be more easily surpassed ... than if suicide is unacceptable and associated with bringing shame to one’s family...” Finally, research examining SES-based differences in YMSM or SMY mental health or suicide risk appears to be especially sparse. The Institute of Medicine’s 2011 paramount report on the state of LGBT health research in the United States² identified similar gaps in the literature across sexual minority health research more generally.

Sexual orientation. There is a limited body of research that explores potential differences in the prevalence of suicide behavior within sexual minority subpopulations. Much of the disparities research has inherently compared SMY to their heterosexual counterparts; accordingly, “sexual minority youth” have often been examined as a single orientation group without regard to underlying subgroups of minority sexual orientations. Importantly, sexual orientation is not fixed, especially among youth, and may change over time as a developmental process.^{2; 76} Within the present sample, prior analyses have shown that these YMSM are engaging in sexual identity exploration and identity

integration during this period of emerging adulthood¹⁵⁷ which likely entails shifting life experiences within the social context, such as finding affirming peers,⁷³ or conversely, experiencing homophobia more saliently.

The inconsistent measurement of sexual orientation across studies, particularly in school-based studies such as the YRBS, presents challenges to an overall summary of identified associations between sexual orientations and SI. Not all survey jurisdictions assess components of sexual orientation, and among those that do, the constructs that are assessed vary across sites. For example, sexual orientation has been inconsistently assessed as the gender of sexual contacts, or the gender of sexual attraction, or self-described sexual orientation identity.^{4; 97}

Existing findings suggest that bisexual SMY and YMSM may be at greatest risk for distress and associated behaviors like suicide behavior, and be less likely to experience the decline over time in suicide ideation or attempt prevalence seen in other SMY.^{7; 8; 27; 93; 105} Further, a review of SMY suicide and depression studies noted that overall the prevalence of suicide behaviors in “sexual minority youth” as a single group was significantly higher than when these groups were separated into bisexually-oriented (higher prevalence) and same gender (lower prevalence) -oriented subgroups.²⁷ Saewyc et al.⁷⁶ contend that observed inequities in risk behaviors among bisexual youth, compared to same-gender oriented or heterosexual peers, might be attributed to lower levels of protective factors such as family or school connectedness.

Summary of existing knowledge. SMY and YMSM report greater lifetime and recent prevalence of suicide behavior compared to their heterosexual peers. Further, there are a number of factors that have theoretical and/or empirical associations with suicide

behavior, including psychological distress and depression, internalized homonegativity, adverse childhood experiences, exposure to others' suicide behaviors, school enrollment, and utilization of mental health treatment. There are also racial and ethnic differences in the prevalence of suicide behaviors in the general youth, adolescent, and young adult population. However, there is a general paucity of literature that examines these factors as they relate to suicide behavior within sexual minority populations. In addition to within-group research, there is also an identified need for longitudinal analyses, particularly during the critical developmental period of emerging adulthood.

The present study. These analyses sought to explore the prevalence of suicide ideation (SI) during emerging adulthood, a high-risk period for suicide behaviors, in a diverse sample of YMSM. The relationships between discrimination, victimization, family rejection, and suicide-related outcomes are well-established in the literature. Accordingly, these analyses focus on other variables that potentially exacerbate or reduce the odds of SI, including adverse childhood experiences, psychosocial factors, exposures to others' suicide behaviors, and utilization of mental health treatment. I also incorporated sociodemographic characteristics in response to the Institute of Medicine's call for sexual minority health research to examine gradations in health and life experiences across sociodemographic groups ² and because there is robust evidence of health inequities across racial, ethnic, and socioeconomic groups.

Based on existing findings, I hypothesized that prevalence of SI would decrease over the three years of follow-up. I also generated hypotheses for the following six categories of independent variables: 1) ACEs: ACEs are associated with higher odds of SI. 2) Psychosocial states: 2a) Psychological distress is associated with higher odds of SI;

2b) Internalized homonegativity is associated with higher odds of SI. 3) Suicide exposures: Knowledge of peers' or family members' suicide behaviors are each associated with higher odds of SI. 4) School enrollment: Enrollment is associated with lower odds of SI. 5) Mental health care: Utilization of mental health treatment is associated with lower odds of SI. 6) Sociodemographics: 6a) White and Hispanic/Latino race/ethnicity are associated with higher odds of SI; 6b) Non-exclusively homosexual orientation indicate higher odds of SI. 6c) Lower SES is associated with higher odds of SI.

Methods

Data are taken from a longitudinal study of drug use, sexual risk behavior, and mental health among urban, emerging adult YMSM recruited in New York City (NYC) between 2009-2011 (N = 600). Participants were recruited using active (e.g., trained recruiters approached all passerby in a given area) and passive methods (e.g., flyers posted) in a diverse range of venues throughout NYC. Formative research was used to identify both gay-identified (e.g., community venues, dance clubs) and non gay-identified (e.g., college campuses). We also utilized Internet based recruitment on both gay-identified and non-gay identified social and sexual networking websites. Finally, once enrolled, participants were offered the opportunity to refer two peers for eligibility screening. If interested, participants received recruitment cards to distribute to peers. We oversampled YMSM of color in order to reflect underlying HIV disparities in NYC. Specifically, we set targets such that >66% of the enrolled sample was non-white.

Eligibility criteria included being 18 or 19 years old, male biological sex, current

residence in the NYC metropolitan area (NYC, Westchester, CT, NJ), a self-reported HIV-negative or unknown HIV status, and sexual activity with another man within the prior six months. In addition to this criteria, YMSM were not eligible if they were enlisted in the military, or if during screening they stated a refusal to undertake 1) a urine-based drug metabolite screening randomly assigned to 50% of men at each wave, and 2) a rapid HIV antibody screening at each wave. In line with human subjects protections, men could refuse participation in any component of the study once they were enrolled. Between May 2009 and July 2011, 2,068 screenings were completed; overwhelmingly, age (i.e., older than 19 years old) was the primary cause for disqualification. Follow-up data was collected during biannual study visits over three years. Study interviewers obtained informed consent at baseline from each participant. The IRB at New York University approved the study protocol, and given the sensitive nature of the study, we obtained a Certificate of Confidentiality from DHHS.

Data for this analysis consist of the yearly waves (baseline, 12 months, 24 months, 36 months) when the outcome of interest (suicide ideation) was assessed. Baseline data were collected using audio computer-assisted self-interview (ACASI) software. Men who relocated after baseline were allowed to complete biannual surveys using web-based survey software; men who completed the study visit on-site continued to use ACASI. Participants received remuneration at each of these study visits or online survey completions (\$35, \$45, \$75, \$100) and for referring peers to the study (\$10 for each referral, limited to 2 referrals).

The sample for this analysis consisted of $N = 598$ men, as two participants had incomplete baseline data and thus were missing data on key variables that were assessed

only at baseline (i.e., race/ethnicity, perceived familial SES, ACEs). The retention of the baseline sample across follow-ups was high, with 84% (n = 504) participation at Month 12, 83% (n = 504) participation at Month 24, and 81% (n = 484) participation at Month 36. Prior analyses indicated that retained participants were not different from those lost to follow-up with regard to sociodemographics.¹¹³

Dependent variable.

Suicide ideation. The primary dependent variable was recent suicide ideation (SI). Men were asked, “During the past 12 months, did you ever seriously think about committing suicide?” Additionally, men who indicated SI were also asked two follow-up questions regarding attempts and attempts requiring medical care (“During the past 12 months, how many times did you actually attempt suicide?” and “Did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?”) These suicide-related behaviors were assessed yearly, and these items replicated questions from the National Longitudinal Study of Adolescent to Adult Health survey.¹⁰⁹

Independent variables.

Sociodemographics. Race and ethnicity were assessed at baseline using two questions (“What is your race?” and “Are you Latino?”). Responses were collapsed into a single variable with categories of Black non-Hispanic, Hispanic/Latino, Asian American/Pacific Islander non-Hispanic, Multiracial/other non-Hispanic, and White non-Hispanic. Perceived familial socioeconomic status (SES) was assessed at baseline using a single item (“What do you perceive to be the economic class of the people who raised

you?") with response options of "lower," "lower middle," "middle," "upper middle," and "upper." Responses were collapsed into "lower SES," "middle SES," and "upper SES."

The use of perceived familial SES is motivated by the young age of this sample at baseline and the low likelihood of having one's own annual income in addition to not being able to accurately recall or know their parent/guardian's actual net income. Finally, age was computed at each assessment point using the date of assessment and self-reported date of birth.

Adverse childhood experiences. Adverse childhood experiences (ACEs) were assessed at baseline. Neglect of basic needs ("How often had your parents or other adult care-givers not taken care of your basic needs, such as keeping you clean or providing food or clothing?"), and childhood sexual abuse ("How often had one of your parents or other adult care-givers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?") were assessed using single questions, and responses choices were "this never happened," "1 time," "2 times," "3-5 times," "6-10 times," and "more than 10 times."

Social services involvement during childhood was assessed using two items ("How often had Social Services investigated how you were taken care of or tried to take you out of your living situation?" and "How often had you actually been taken out of your living situation by Social Services?"). Participants reported free-response frequencies for these two items. The ACE items replicated questions from the National Longitudinal Study of Adolescent to Adult Health survey, Wave 3.¹⁰⁹ All ACE items were transformed to yes/no dichotomous variables for analysis. Finally, parental history of depressive symptoms was assessed with a single item ("Did either of your parents ever suffer from

depression, did they feel so low for a period of weeks or months that they hardly ate, or couldn't work or whatever they usually did?").

Sexual orientation was assessed yearly using the 7-point Kinsey scale,¹²⁰ where "0" indicated "exclusively heterosexual," and "6" indicated "exclusively homosexual." Based on the observed distributions, responses were collapsed into "not exclusively homosexual" and "exclusively homosexual" for analysis.

Psychological distress. Psychological distress was assessed yearly using 14 cognitive-affective items (e.g., sadness, self-dislike, anhedonia) from the Beck Depression Inventory-II [BDI-II].¹²¹ In exploratory factor analyses, somatic items tended to have high uniqueness and/or low factor loadings, while cognitive-affective items had high loadings and low uniqueness (see Manuscript 1). Additionally, for the present analysis, I removed the suicide ideation item from the cognitive-affective scale because it duplicated the outcome of interest for this analysis. With this item removed, the cognitive-affective subscale still evidenced good reliability at each wave ($\alpha = 0.89$ to 0.93), essentially equivalent to the reliability for the original subscale with the suicide ideation item included ($\alpha = 0.90$ to 0.93).

Internalized homonegativity. Internalized homonegativity was assessed yearly using four items from the Young Men's Survey, as reported in Thiede et al.¹²⁵ The four items included "Sometimes I dislike myself for being gay or bisexual," "I feel stress and conflict within myself over having sex with men," "Sometimes I wish I was not gay or bisexual," and "I sometimes feel guilty after having sex with men." For each item, responses were collected on a 5-point Likert-type scale, ranging from "strongly disagree" to "strongly agree." A total score was created using the sum of the four items.

School enrollment. Current school enrollment was assessed yearly with a single binary item (“Are you currently in school?”). Men who indicated current enrollment were also asked, “In what level of school are you currently enrolled?” with response choices of “Junior high school,” “High school,” “College/university,” and “Trade/vocational school.”

Health care insurance and mental health treatment utilization. Health care insurance coverage was assessed yearly using a single binary item (“Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or governmental plans such as Medicare or Medicaid?”) Having utilized mental health treatment was assessed at baseline (“Have you ever seen a mental health professional for counseling/therapy or treatment in the past?”) and at each yearly follow-up (“In the last 12 months have you seen a mental health professional for counseling/therapy or treatment?”) with a binary item.

Knowledge of others’ suicide attempts. Knowledge of friends’ suicide attempts (“Have any of your friends tried to kill themselves during the past 12 months?”) and family members’ suicide attempts (“Have any of your family members tried to kill themselves during the past 12 months?”) were assessed yearly. Additionally, if men indicated friends’ or family members’ attempts, a follow up question regarding suicide completion was asked for the respective friend/family category (“Did any of them succeed?”). These items replicated questions from the National Longitudinal Study of Adolescent to Adult Health survey, Wave 3.¹⁰⁹

Analytic plan. First, descriptive analyses were used to characterize the sample and the suicide behaviors within the sample. Next, multivariable logistic regression was used

to test cross-sectional associations between the independent variables and SI. Before progressing to the longitudinal multivariable model, the within-subject correlation structure (i.e., how an individual's response to the SI item correlated over time) was examined in order to correctly specify the working correlation matrix. The correlation structure was assessed using correlation matrices, transition analyses, and visual inspection of a lorelogram, which depicts the marginal log-odds of within-individual SI at each lag. The longitudinal multivariable model was constructed using generalized estimating equations (GEE), a marginal model for the mean response (i.e., the population average). The GEE approach was necessary to adjust the estimation of the standard errors of the regression coefficients in order to account for the within-subject clustering that occurs in repeated observations within longitudinal studies. An additional advantage of GEE is its robustness to misspecification of the within-subject correlation model (provided that the mean component is correctly specified).¹⁸¹⁻¹⁸³

Finally, while the primary outcome of interest was SI, two additional models examined persistent SI and suicide attempts. Multivariable logistic regression models were used to test 1) whether men who reported both ideation & attempt differed from men who reported only ideation, and 2) whether men who indicated ideation at more than one follow-up differed from those who experienced ideation only once.

Robust standard errors were computed for the models. Variables were tested for multicollinearity and redundancy using VIF and tolerance values. All analyses were conducted using Stata 14.¹⁸⁴

Results

The analytic sample and variables of interest are detailed in Table 1. In summary, more than two-thirds of the sample (71%, $n = 425$) identified as racial/ethnic minority YMSM. Perceived familial SES was evenly distributed across the three strata of lower, middle, and upper SES. With regard to ACEs, approximately a tenth (9%, $n = 53$) of men experienced neglect of basic needs, and 6% ($n = 38$) experienced sexual abuse by a caregiver. Social services investigation (17%, $n = 99$) was the most commonly reported ACE, and 6% ($n = 36$) of men were removed from their home at least once.

Longitudinal trends in independent variables. At baseline, 41% ($n = 248$) of the men indicated an “exclusively homosexual” orientation, and this proportion increased to 51% ($n = 245$) at the final wave. The majority of men were currently enrolled in school at baseline (86%, $n = 512$), and approximately three-quarters of YMSM remained in school until a decrease at the final wave (58%, $n = 278$). Across the four waves, school enrollment was almost exclusively in college/university programs (80%, 93%, 95%, and 95%, respectively) versus trade or vocational schools (2%, 2%, 2%, 5%).

Mental health treatment utilization was highest at baseline (51%, $n = 305$) likely reflecting the lifetime recall period. At each follow-up, approximately one-quarter of men (23-24%) reported past-year use of mental health treatment. The majority of men had health care coverage at each assessment (87%, 81%, 78%, 76%) although the proportion with coverage decreased over time. Mean baseline scores for psychological distress ($M = 5.9$, $SD = 6.30$) and internalized homonegativity ($M = 4.5$, $SD = 4.22$) were low, relative to the scales’ potential and observed ranges, and mean scores decreased over time.

At baseline, approximately a quarter (23%, $n = 136$) of YMSM knew of a friend who had attempted suicide in the past year; this decreased to 10% ($n = 47$) by Month 36. The proportion of men with friends who had completed suicide in the past year was also highest at baseline (5%) and decreased to 2% by Month 36. At baseline, 5% of YMSM had a family member who recently attempted suicide and this decreased to 2% by Month 36. Completed suicides among family members were relatively rare across the study period (1% at baseline, 0.21%, 0%, and 0.21% at respective follow-ups).

Longitudinal trends in suicide behaviors. A quarter (26%) of YMSM reported SI at least once during the study period. Overall, prevalence of SI peaked at baseline (17%). SI was lowest at Month 24 (6%), and was reported by 7% of men at Month 36. There was evidence that SI sometimes recurred, as 42% of ever-ideators' datapoints included reports of SI.

At each wave, 30%, 27%, 10%, and 26% of men with SI also attempted suicide during that period. The overall prevalence of any suicide attempt among ever-ideators was 31%. Among those with suicide attempts, 33%, 8%, 33%, and 25% required medical care for injuries resulting from the attempt. (Note that these rates are not based on the total sample; rather, these proportions are based on the denominators from the prior question. For example, the denominator for attempters was predicated on the total number of men who reported SI, and in turn, the denominator was even smaller for medically serious attempts).

Cross-sectional and longitudinal multivariable models for SI. I compared the results of modeling SI cross-sectionally (baseline) versus longitudinally (using all four datapoints). The same independent variables were included in the models, except for

completed suicides by family members due to the extreme rarity of this event in the dataset. Multivariable logistic regression was used to test adjusted associations between the independent variables and the odds of reporting SI.

Cross-sectional multivariable model of SI. The cross-sectional multivariable model for SI is detailed in Table 2. The overall model fit was statistically significant ($\chi^2(21) = 94.08, p < 0.001$; pseudo $R^2 = 22.39\%$), but only two statistically significant variables emerged. Having utilized mental health treatment (AOR = 1.79, $p = 0.04$, 95% CI 1.01 to 3.17) and higher psychological distress (AOR = 1.14, $p < 0.001$, 95% CI 1.10 to 1.19) were associated with greater odds of SI. Age, race/ethnicity, perceived familial SES, exclusively homosexual orientation, school enrollment, internalized homonegativity, ACEs, knowledge of others' suicide attempts, and knowledge of completed peer suicide(s) were not significantly associated with the odds of past-year SI.

Longitudinal multivariable model. The longitudinal multivariable model for SI is detailed in Table 3. Exploratory analyses indicated that an exchangeable correlation structure was appropriate for this longitudinal model (within subject correlation = 0.23 to 0.12). The overall model fit was statistically significant ($\chi^2(22) = 175.15, p < 0.001$; pseudo $R^2 = 18.11\%$). Increasing age (AOR = 0.73, $p < 0.001$, 95% CI = 0.62 to 0.86) was associated with lower odds of SI, indicating that the odds of SI decreased over time. Conversely, psychological distress (AOR = 1.15, $p < 0.001$, 95% CI = 1.12 to 1.18), neglect of basic needs in childhood (AOR = 2.12, $p = 0.03$, 95% CI = 1.07 to 4.19), and knowledge of a peer's recent suicide attempt (AOR = 1.78, $p = 0.02$, 95% CI = 1.12 to 2.83) were all associated with greater odds of recent SI. Race/ethnicity, perceived familial SES, sexual orientation, other ACEs (sexual abuse, social services involvement,

parental depression), health care insurance, utilization of mental health treatment, school enrollment, knowledge of a family member's suicide attempt, and knowledge of a peer's suicide completion were not associated with the odds of past-year SI.

Sub-analysis for persistent ideation. Logistic regression was used to test whether men with persistent ideation differed from men with a single report of ideation. A new variable indicating "persistent ideation" was generated, where men with ≥ 2 reports of suicide ideation were coded as "persistent ideation." This cut point was chosen based on the aforementioned average within-participant reoccurrence of SI among ideators (i.e., reporting SI at 42% the four datapoints, on average). As this was a time-invariant variable (i.e., computed from all waves), this logistic regression incorporated only the time-invariant variables (i.e., race/ethnicity, SES, and ACEs). The overall model fit was not statistically significant compared to a constant-only model ($\chi^2(11) = 13.79, p = 0.24$).

Sub-analysis for suicide attempt. To examine whether men who reported both SI and attempt(s) differed from men with SI but no attempt(s), a cross-sectional logistic regression model was tested. A single variable was created to indicate a history of suicide attempt. Men with ≥ 1 report of suicide attempt were coded as "ever attempters." Again, as a time-invariant variable (i.e., computed from all waves), this logistic regression incorporated only the other time-invariant variables (i.e., race/ethnicity, SES, and ACEs). The overall model fit was not statistically significant compared to a constant-only model ($\chi^2(10) = 11.68, p = 0.30$).

Discussion

These analyses explored suicide ideation in a diverse sample of emerging adult YMSM, and examined whether sociodemographics, adverse childhood experiences, psychosocial states, knowledge of others' suicide attempts, mental health care, and school enrollment. These findings help to shed light on underlying factors that appear to exacerbate the risk of SI among YMSM.

One-fourth of YMSM experienced SI at least once during the three years of follow-up; conversely, three-quarters did not. This finding aligns a general observation made across YMSM and SMY mental health research, in that a subgroup of individuals indicate risk, but typically the majority of individuals are not experiencing significant levels of risk.^{2;}

10; 16; 51; 67; 73; 88-90; 111

Excluding baseline prevalence, the 12-month prevalence of SI in this sample (6% to 9% at follow-ups) was near the upper bounds of population estimates for 12-month prevalence of SI in adults ages 18 and older in the United States (2%-10%).^{39.} The baseline prevalence of SI in the present sample is somewhat higher than the 12-month prevalence observed among adolescents ages 13-17 in the NCS-A (12%)⁴⁰ but lower than 12-month prevalence among SMY in the YRBS (25%).⁴ The NCS-A and YRBS sampled a typically younger group (i.e., adolescents), but YMSM in the present sample were still 18 or 19 at baseline (i.e., at the tail end of adolescence); thus it is not unreasonable to compare these YMSM's baseline prevalence (17%) to the prevalence observed in these general adolescent samples.

Among men with SI, between one-tenth to one-third also reported a suicide attempt in that period. These proportions align somewhat with attempt data from the NCS-A, where a third of adolescents with SI progressed to an attempt.⁴⁰ While we did not assess the means used, typically one-quarter to one-third of YMSM attempters required medical care, suggesting that a significant proportion of these attempts were severe and potentially lethal. We note that individuals who progress to suicide attempts are at greater risk for future attempts or completion^{21; 38; 39; 185} and thus these YMSM are likely at higher risk for future attempts and completion than other men in the sample. Sub-analyses indicated that men who attempted suicide did not differ from those who did not progress beyond SI with regard to race/ethnicity, perceived familial SES, or having experienced adverse childhood events. There was also considerable within-person reoccurrence of SI. Patterns of persistent SI have been previously observed in similarly-aged emerging and young adult populations.^{186; 187} Repeat or persistent SI could be an indicator of more severe and persistent underlying distress.¹⁸⁶

Overall, SI peaked at baseline with 1 in 6 men reporting SI, and SI subsequently decreased to about 1 in 14 men at the follow-ups. This replicates general evidence regarding suicide behavior trends in adolescence and young adulthood. In the general population, suicide behavior tends to decrease and level off in early adulthood²¹ and similar trends have been observed among SMY.⁷ A number of factors might help to explain the observed decrease in SI over time in this sample. In general, adolescence and emerging adulthood are times of exploration, challenge, and transition.^{1; 21; 91} While the freedom and exploration in this period entails some level of volatility and instability, it also confers opportunities to forge and integrate identities (sexual and otherwise), to

connect with others and develop affirming relationships (platonic and romantic), and for some men, to potentially distance himself (psychological, financially, and geospatially) from sources of stress such as a dysfunctional family or victimization by peers.^{1; 22; 51; 57; 73; 86; 92; 94}

It is also important to note the high prevalence of mental health treatment utilization at baseline (51%). The YMSM in this sample may have had generally better (or worse) “initial status” for mental health than other YMSM, and may have been connected with services that cultivated resiliencies or coping skills, which we did not assess. Additionally, declines in SI may simply represent regression to the mean, along with the observed declines in distress and internalized homonegativity. It is also plausible that study participation itself had a “non-intervention intervention” effect. Intervention research suggests that resource non-intensive forms of contact (e.g., letters, phone calls) can reduce recurrent suicide attempts.^{39; 185; 188} Men in this study had biannual contact with study staff in a community-based research organization, they were offered community referrals if they reported or evidenced significant distress at any study wave, and they repeatedly completed a measure of suicide risk. The experience of regular interactions with staff, and potential referrals, could have reduced SI. Short of randomized experiments nested within longitudinal studies (e.g., comparing intensive staff interaction versus non-interaction), one pragmatic means to assess these potential influences is to systematically track formal referrals and control for referrals in analyses.

Finally, there is the potential for external influences that could explain the declines in SI observed here. Namely, during the study period (2009-2014), there was significant mainstream social attention to SMY mental health and suicide (e.g., The ‘It

Gets Better' Project^{TM161}). These exogenous factors or other secular trends could also explain the declines in SI that we observed if they reduced distress or hopelessness of YMSM, or increased others' sensitivity to YMSM mental health, or reduced homophobia in the social environment (i.e., a secular trend). To date, there do not appear to be systematic or scientifically rigorous assessments of whether these social media campaigns or media coverage have influenced SMY, YMSM, or the larger populace.

Before discussing the constructs that were significantly associated with SI longitudinally, it is important to point out the potential shortcomings of an exclusively cross-sectional approach (as demonstrated by the baseline-only model). First, a cross-sectional approach would not have identified the general trends of improvement that manifested over time. Additionally, the cross-sectional model indicated that SI was statistically associated with only utilization of mental health treatment and with higher distress scores; these are not particularly novel or actionable findings alone, given the aim to identify factors associated with SI. In the prospective model of SI, additional relevant covariates emerged: age (which reflects the decrease in SI over time), childhood neglect, and knowledge of peers' suicide attempt(s).

First, the experience of childhood neglect appears to have a long-lasting association with SI, in that it predicted a twofold increase in the odds of SI over the study period. This relationship is congruent with existing knowledge regarding the life course impacts of childhood adversity, which include psychiatric problems and suicide behavior, in addition to increased likelihood of exposures to additional stressful events.^{25; 41; 43; 80} The relationship between childhood neglect and suicide behavior is complex, and empirical data suggests underlying interactive processes between neurobiological

changes, personality traits (e.g., aggression and impulsivity), attachment styles (and in turn, poorer social integration and connectedness) that are associated with increased risk for suicide^{167; 189-191} Additionally, other outcomes associated with childhood neglect (e.g., substance use) might mediate or moderate the associations between neglect and suicide risk.^{21; 41-43; 78; 167}

Second, knowledge of a peer's suicide attempt was associated with a 78% increase in the odds of SI. At baseline, 1 in 4 men knew a friend who attempted suicide in the prior 12 months. Notably, this decreased to about 1 in 10 men at subsequent follow-ups. It is plausible that this decline in reported peers' suicide attempts reflects the general population trend in SI as well as the trend observed in the analytic sample (i.e., reducing over time from adolescence into young adulthood). It is important to note that we did not assess the social proximity of that "friend," however, and it is plausible that proximity moderates the association between peer attempt and one's own SI or psychological sequelae of exposure.^{168; 170} Still, this exposure represents a potential risk factor for YMSM's own SI. The documented salience of peer attempts, both presently and in existing literature, suggests that young adult suicide behavior screenings should include peer exposures as a risk factor.^{42; 44} Further, having had knowledge of a deceased peer's intention to commit suicide has been shown to increase the risk of subsequent onset of PTSD or depression in adolescents.¹⁶⁸ These effects are potentially long-lasting; Abrutyn et al¹⁷¹. found that the association between boys' own suicide behaviors and their exposures to peer suicide attempts persisted for at least a year. Such findings challenge overly simplified interpretations of Durkheimian perspectives on social connectedness

and suicide, in that social ties are not inherently protective and must be examined with nuance.¹⁷¹

Despite the link between men's own SI and their peers' suicide attempts, we did not find a relationship between exposure to peers' completed suicides and YMSM's own SI. These two findings (attempts, but not completions are associated with one's own SI) align with prior literature.^{42; 170} The null finding with regard to peer completions may be attributed to the relative rarity of completed suicides compared to attempts⁴² as was observed here.

The implications of this finding should also be discussed within the broader social context. Given the existing evidence that media coverage of others' suicides can engender suicide risk,^{43; 44} this finding may represent the "double-edged sword" of publicizing youth suicide behavior, or the use of detailed individual stories to draw support for LGBT health initiatives. That is, high-profile media coverage and advocacy campaigns raise awareness of the issue of SMY suicide, yet could also have a contagion effect. The media contagion effect may be particularly salient for youth.⁴²⁻⁴⁴ While there are mainstream media guidelines for safer reporting of suicides, the proliferation of social media and information available on the Internet may not abide by these guidelines.⁴⁴ If conceptualized as an echo chamber, both these proximal peer attempts and intensive and/or sensationalized media coverage of SMY suicides could explain part of the disproportionate suicide risk among SMY and YMSM.

Mental health treatment, either prior to baseline or during the study period, was not associated with suicide ideation. This finding might reflect unmet mental health needs among these YMSM. Still, as noted by Nock et al.⁴⁰ adolescents are often already

utilizing mental health care before they engage in suicide behaviors. This general evidence, along with the present finding, suggests that mental health treatment in general does not wholly prevent suicide behavior. In an extensive review of suicide behavior and prevention, Hawton et al.⁴³ assert that the treatment of suicide risk is challenging given the multitude of its underlying antecedents. We also did not assess the type of treatment received, and as Nock et al.⁴⁰ caution, “treatment” may also be interpreted by respondents as other social services, school-based services, or services related to the criminal justice system rather than more clinically-oriented intensive mental health treatment. The vast majority of YMSM were also enrolled in school, which likely confers access to school based services, as well as insurance coverage. Neither school enrollment nor insurance coverage were associated with SI, perhaps attributable to limited variance within these variables.

Not surprisingly, higher levels of psychological distress were significantly associated with an increased odds of SI. This finding is in concordance with the abundant evidence that symptoms of distress and/or depression are associated with suicide behaviors.^{8; 10; 21; 37-42} Accordingly, individuals with evident distress or depression should be routinely screened for suicide behaviors.⁴³ The utility of the psychological distress variable in these models may instead lie with its ability to be used as a control variable. That is, other factors that increased the odds of SI (i.e., childhood adversity, knowledge of peers’ attempts) were significant after adjusting for psychological distress scores.

Unlike psychological distress, internalized homophobia was not associated with SI. Given the plausible and documented association between internalized homophobia and distress,^{50; 56-63} it may be that the measure of psychological distress better captures

variance in the SI – distress association. The null finding might also suggest that for these YMSM, stressors associated with SI are not related to self-image regarding their sexual orientation. Instead, stressors and challenges relevant to adolescents and emerging adults, irrespective of sexual orientation, are salient risk factors for SI among these YMSM. Indeed, D’Augelli et al.¹⁶⁴ found that approximately a third of sexual minority adolescents and young adults who reported suicide attempts did not attribute their attempts to their sexual orientation.

Notably, no differences in SI were found across sociodemographic categories of race/ethnicity, perceived familial SES, and sexual orientation. It is plausible that the other variables in these models capture some of the underlying inequities in health resources and health risks that are fundamental sources of health disparities.^{95; 96} Further, these men were recruited in the New York City metropolitan area, a region that may be characterized as having greater availability of supportive services for individuals across race, ethnicity, SES, and sexual orientation.

These findings have a number of implications for research and clinical practice in addition to those already discussed. First, inferences drawn from cross-sectional studies may not be representative of overall patterns of SI.⁹ Future longitudinal research might inform interventions if it explores recurrent or persistent SI among YMSM or SMY with more nuance; for example, 1) What factors precipitate persistent SI, or resolution of SI, and 2) Do these factors differ from those known from the general population? Using latent class growth analysis, Reuter et al.¹⁹² identified three distinct SI groups of adolescents in a sample of White adolescents (no SI, decreasing SI, and persistent/increasing SI). Future research should explore this type of potential

heterogeneity in SI trajectories among YMSM. While this study did not compare manifestations or patterns of SI in YMSM compared to other groups (e.g., heterosexuals), there is a notable lack of depression interventions tailored for YMSM.^{7; 23}

With regard to identifying YMSM with SI, suicide behavior screenings should incorporate exposure to peers' attempts as these exposures are salient to YMSM's own risk. There is also potential need for long-term clinical monitoring of YMSM who ever reported SI, as YMSM who report declines or absence of SI at a subsequent follow-up may in fact experience a recurrence of SI in the future. Intervention and monitoring may not need to be resource-intensive. For example, relatively low burden forms of maintained contact (e.g., letters, follow-up phone calls, or mHealth programs) can reduce repeat suicide behaviors, and further, have demonstrated efficacy in reducing risk among those who are not otherwise engaged in care.^{39; 185; 188}

Limitations. There are a number of general limitations that must be noted in addition to those already discussed. First, these analyses primarily addressed suicide ideation. While sub-analyses were undertaken with regard to suicide attempters and persistent ideators, these analyses were less nuanced than SI-focused analyses as they were hindered by the relative infrequency of their occurrence and could only be modeled cross-sectionally.

Across studies, varying facets of "suicidality" have been examined and the present findings should not be generalized to other types of suicide behavior. Indeed, the large proportion of existing research that has aggregated suicide ideation, planning, and attempts into a single "behavior" indicator made it quite challenging to extrapolate details about specific suicide behaviors (and specific subpopulations). Along these lines, these

findings should not be generalized to SMY as a whole, and the findings may not be representative of all YMSM more specifically. External validity is limited by the use of a convenience sample, as well as the oversampling of YMSM of color. These findings are potentially relevant to other mostly urban-residing YMSM, but even this generalizability may be limited outside the NYC metropolitan area.

Additionally, men who were highly distressed may have been less likely to enroll, or more likely to miss a given wave. While differential enrollment is inherently impossible to test, two post-hoc analyses were used to assess differential retention: 1) whether data are missing not at random, and 2) whether study dropout was associated with baseline SI. First, post-hoc logistic regressions indicated that a given wave's missingness was not associated with the immediately preceding or proceeding wave's SI status (p -values = 0.35 to 0.97). This result lends some creditability to the assertion that SI was discontinuous in this sample, in that subsequent-wave SI status does not appear to be biased by differential follow-up completion. The second analysis indicated that study dropout (i.e., missing all waves after follow-up) was not predicted by either baseline SI status (p -value = 0.20) or baseline psychological distress score (p -value = 0.79).

In terms of data collection, mental health and childhood adversities are potentially sensitive topics and could be subject to social desirability bias. However, data were collected using ACASI or computer-based programs to reduce potential bias.^{39; 114-116} These analyses also did not address other potential protective factors (e.g., social support) risk factors (e.g., victimization, substance use, acute and stressful events) or life course experiences (e.g., coming out) that could influence SI. Other demographics and risk factors such as homelessness are relevant.¹⁹³ The parent study did assess perceived social

support and recent substance use, however, these data were not available at the time of analysis, and also were not administered to men who completed follow-up surveys remotely (thereby reducing the available sample size for these analyses). Finally, we note a potential limitation of the sexual abuse measure, in that the question only assessed abuse by parents or caregivers, while other non-caregiver adults may have perpetrated abuse.

There are also strengths to note. The prospective design of the study can help to address a number of identified gaps in the literature. Additionally, we assessed SI at yearly waves with past-year recall periods, rather than lifetime recall periods. “Lifetime” self-reports of suicide attempts in adolescent and young adulthood may be somewhat inconsistent over time.¹⁹⁴ The shorter recall periods used presently may have helped to reduce inconsistencies in reporting SI. Additionally, the over-sampling of racial/ethnic minority YMSM allows for across-group analyses that are typically precluded by small cell sizes in existing datasets.

Conclusions

While a subset of YMSM reported SI during a three year period in emerging adulthood, the majority of YMSM did not report SI during this critical period of development. Although substantial heterogeneity in sampling and measurement across the literature complicates comparisons, the 12-month prevalence of SI in this sample appears to be slightly lower than recent prevalence observed among younger adolescent SMY. However, these 12-month estimates were still higher than published lifetime

estimates for heterosexual adults. YMSM who did report SI had fluctuations in SI across the four study waves. Overall, SI decreased during the three years of follow-up. As expected, psychological distress was associated with increased odds of SI. In contrast with data on adolescents and young adults in the general population, no differences were found across racial/ethnic categories. Rather, childhood neglect and knowledge of peers' suicide attempts increased the odds of reporting SI. These findings point to several areas for future research. These include inquiry into the factors that precipitate or reduce SI over time, the mechanism underlying the association between peer attempts and YMSM's own SI, and other life course factors that might be associated with SI in emerging adult YMSM. Intervention-oriented research might also explore protective factors that might help to explain why, despite well-documented adversity and stigma, the majority of YMSM in our sample did not report SI. This line of future research has implications for interventions, among which there is a dearth of resiliency-based approaches.^{51; 140}

Table 1. Sample descriptives.**(N = 598).**

| | % or Mean (n or SD) | | | |
|--|------------------------|---------------------|---------------------|---------------------|
| | Baseline (n = 598) | 12 mo. (n = 496) | 24 mo. (n = 497) | 36 mo. (n = 483) |
| Age | 18.76 (0.51) | 19.79 (0.53) | 20.79 (0.53) | 21.77 (0.57) |
| Race/ethnicity | | | | |
| Black | 14.88 (89) | -- | -- | -- |
| Latino | 38.29 (229) | -- | -- | -- |
| API | 4.85 (29) | -- | -- | -- |
| Multiracial/other | 13.04 (78) | -- | -- | -- |
| White | 28.93 (173) | -- | -- | -- |
| Familial SES | | | | |
| Lower | 33.44 (200) | -- | -- | -- |
| Middle | 37.12 (222) | -- | -- | -- |
| Upper | 29.43 (176) | -- | -- | -- |
| Exclusively homosexual | 41.47 (248) | 46.41 (233) | 48.19 (239) | 50.72 (245) |
| Enrolled in school | 85.62 (512) | 80.65 (400) | 72.01 (355) | 57.56 (278) |
| Childhood adversity | | -- | -- | -- |
| Basic needs neglected | 8.86 (53) | -- | -- | -- |
| Sexual abuse | 6.35 (38) | -- | -- | -- |
| Social services investigation | 16.56 (99) | -- | -- | -- |
| Social services removal from home | 6.02 (36) | -- | -- | -- |
| Parental depressive symptoms | 37.41 (220) | -- | -- | -- |
| Psychological distress | 5.92 (6.30) | 4.68 (5.88) | 4.03 (5.60) | 4.37 (6.09) |
| Internalized homonegativity | 4.49 (4.22) | 3.08 (3.76) | 2.84 (3.76) | 2.56 (3.43) |
| Health care insurance coverage | 87.12 (521) | 80.68 (405) | 77.87 (387) | 76.03 (368) |
| Utilized mental health treatment - ever | 51.00 (305) | -- | -- | -- |
| Utilized mental health treatment – 12 mo. | -- | 22.78 (113) | 23.94 (118) | 24.22 (117) |
| Knowledge of others' suicide attempts 12 mo. | | | | |
| Peer attempt | 22.97 (136) | 14.20 (68) | 10.29 (49) | 10.04 (47) |
| Peer completion | 4.73 (28) | 3.76 (18) | 2.52 (12) | 2.14 (10) |
| Family member attempt | 4.72 (28) | 2.67 (13) | 2.07 (10) | 2.11 (10) |
| Family member completion | 1.01 (6) | 0.21 (1) | 0 (0) | 0.21 (1) |
| Suicide ideation – 12 mo. | 16.56 (99) | 9.07 (45) | 5.87 (29) | 7.04 (34) |
| Ever ideation -- study period | | 26.00 (156) | | |
| Suicide attempts – 12 mo. | 30.30 (30) | 26.67 (12) | 10.34 (3) | 23.53 (8) |
| Ever attempt(s) – study period | | 30.77 (48) | | |
| Medically-serious attempts – 12 mo. | 33.33 (10) | 8.33 (1) | 33.00 (1) | 25.00 (2) |
| Ever medically-serious – study period | | 29.17 (14) | | |

Table 2. Cross-sectional, baseline multivariable model of suicide ideation.**(N = 584).**

| | Estimates | | | |
|---------------------------------------|-----------|-------------|----------|--------------|
| | AOR | Robust S.E. | <i>p</i> | 95% CI |
| Age | 0.91 | 0.25 | 0.74 | 0.54 to 1.55 |
| Race/ethnicity ^a | | | | |
| Black | 1.35 | 0.57 | 0.47 | 0.59 to 3.08 |
| Latino | 0.93 | 0.34 | 0.84 | 0.45 to 1.91 |
| API | 0.73 | 0.58 | 0.70 | 0.16 to 3.47 |
| Multiracial/other | 1.71 | 0.69 | 0.18 | 0.78 to 3.78 |
| Familial SES ^b | | | | |
| Lower | 1.70 | 0.63 | 0.15 | 0.82 to 3.52 |
| Middle | 1.89 | 0.68 | 0.08 | 0.93 to 3.83 |
| Exclusively homosexual | 1.26 | 0.34 | 0.40 | 0.74 to 2.13 |
| Enrolled in school | 1.43 | 0.59 | 0.38 | 0.64 to 3.20 |
| Childhood adversity | | | | |
| Basic needs neglected | 1.58 | 0.74 | 0.33 | 0.63 to 3.96 |
| Sexual abuse | 1.85 | 0.95 | 0.23 | 0.68 to 5.04 |
| Social services investigation | 0.77 | 0.34 | 0.55 | 0.32 to 1.83 |
| Social services removal from home | 0.49 | 0.31 | 0.26 | 0.14 to 1.73 |
| Parental depressive symptoms | 1.46 | 0.42 | 0.19 | 0.83 to 2.57 |
| Psychological distress | 1.14* | 0.02 | < 0.001 | 1.10 to 1.19 |
| Internalized homonegativity | 1.04 | 0.03 | 0.25 | 0.98 to 1.10 |
| Health care insurance coverage | 1.21 | 0.49 | 0.64 | 0.55 to 2.68 |
| Utilized mental health treatment | 1.79* | 1.79 | 0.04 | 1.01 to 3.17 |
| Knowledge of others' suicide attempts | | | | |
| Peer attempt | 1.44 | 0.48 | 0.27 | 0.75 to 2.77 |
| Peer completion | 1.91 | 1.07 | 0.24 | 0.64 to 5.70 |
| Family member attempt | 1.19 | 0.57 | 0.58 | 0.46 to 3.06 |

* $p < .05$ ^a Reference group is White^b Reference group is Upper SES

Table 3. Longitudinal multivariable model of suicide ideation.**(N = 587).**

| | Estimates | | | |
|---------------------------------------|-----------|-------------|----------|--------------|
| | AOR | Robust S.E. | <i>p</i> | 95% CI |
| Age | 0.73* | 0.06 | < 0.001 | 0.62 to 0.86 |
| Race/ethnicity ^a | | | | |
| Black | 1.15 | 0.39 | 0.67 | 0.60 to 2.22 |
| Latino | 1.18 | 0.31 | 0.51 | 0.71 to 1.97 |
| API | 0.77 | 0.48 | 0.68 | 0.23 to 2.63 |
| Multiracial/other | 1.40 | 0.44 | 0.28 | 0.76 to 2.60 |
| Familial SES ^b | | | | |
| Lower | 1.03 | 0.27 | 0.89 | 0.63 to 1.71 |
| Middle | 1.25 | 0.32 | 0.37 | 0.77 to 2.05 |
| Exclusively homosexual | 1.08 | 0.21 | 0.68 | 0.74 to 1.58 |
| Enrolled in school | 1.28 | 0.32 | 0.32 | 0.79 to 2.10 |
| Childhood adversity | | | | |
| Basic needs neglected | 2.12* | 0.74 | 0.03 | 1.07 to 4.19 |
| Sexual abuse | 1.31 | 0.47 | 0.45 | 0.65 to 2.63 |
| Social services investigation | 0.70 | 0.26 | 0.34 | 0.34 to 1.45 |
| Social services removal from home | 0.55 | 0.28 | 0.24 | 0.20 to 1.48 |
| Parental depressive symptoms | 0.95 | 0.20 | 0.81 | 0.63 to 1.44 |
| Psychological distress | 1.15* | 0.02 | < 0.001 | 1.12 to 1.18 |
| Internalized homonegativity | 1.01 | 0.02 | 0.42 | 0.97 to 1.06 |
| Health care insurance coverage | 1.16 | 0.30 | 0.58 | 0.69 to 1.92 |
| Utilized mental health treatment | | | | |
| Baseline (ever) | 1.46 | 0.33 | 0.09 | 0.94 to 2.27 |
| Follow-ups (past 12 mo.) | 1.43 | 0.35 | 0.15 | 0.88 to 2.33 |
| Knowledge of others' suicide attempts | | | | |
| Peer attempt | 1.78* | 0.42 | 0.02 | 1.12 to 2.83 |
| Peer completion | 1.28 | 0.51 | 0.54 | 0.58 to 2.79 |
| Family member attempt | 0.94 | 0.37 | 0.87 | 0.43 to 2.02 |

* $p < .05$ ^a Reference group is White^b Reference group is Upper SES

Chapter 6:

Synthesis and Discussion of Findings

Chapter 6: Synthesis and Discussion of Findings

Overview. This dissertation explored longitudinal heterogeneity in mental health among emerging adult YMSM, with specific attention to psychological distress, internalized homonegativity, and suicide ideation. These within-group analyses were undertaken using data from a cohort of YMSM who participated in a longitudinal study with three years of follow-up. Using latent class growth analysis (LCGA), growth mixture modeling (GMM), latent growth curve modeling (LGCM), and longitudinal regression, I examined whether sociodemographics, psychosocial factors, and adverse childhood experiences predicted differences in mental health during emerging adulthood. Below, the major findings from each manuscript are briefly reviewed. Following these summaries, I synthesize the major findings within the context of existing literature, discuss broad limitations related to the analyses, and explore the implications for research and clinical practice.

Trajectories of psychological distress. Manuscript 1 examined trajectories of psychological distress over the three years of follow-up. Using growth mixture modeling, three distinct trajectories were identified: low and stable distress, moderate and increasing distress, and high but substantially decreasing distress. The majority of YMSM (83%) were in the low and stable distress trajectory. Approximately 6% of YMSM were in the moderate and increasing distress trajectory, which had moderate levels of distress that were persistent and/or increasing over the study period. This group had the highest levels of distress by Month 36. Having a parent(s) with a history of depressive symptoms predicted YMSM membership in this trajectory. The third trajectory consisted of 11% of

the YMSM. This trajectory had the highest initial level of distress, yet declined substantially over the three years of follow-up; by Month 36, their average level of distress was comparable to the “low and stable” trajectory. Interestingly, childhood histories of neglect and sexual abuse predicted membership in this high-but-decreasing trajectory. Neither racial/ethnic majority (White) versus racial/ethnic minority (non-White) identity, nor perceived familial SES were associated with trajectory memberships.

Internalized homonegativity. Manuscript 2 explored internalized homonegativity (IH) using latent growth curve modeling among a subset of the overall sample. Overall, the average IH level was low at baseline and continued to decrease over time. However, there was substantial heterogeneity in initial IH levels as well as how these IH levels changed over time. IH was consistently associated with psychological distress across the four assessment points. Men with exclusively homosexual orientation had lower IH at each assessment compared to non-exclusively homosexual peers, though the magnitude of this association decreased with time. Being hurt by others’ reactions to one’s homosexuality was associated with IH at baseline and Month 12, but the association dispersed at Months 24 and 36. Race/ethnicity, perceived familial SES, religion in family of origin, and school enrollment were not associated with IH.

Suicide ideation. Manuscript 3 examined past-year suicide ideation (SI) over the three years of follow-up. A quarter of the men (26%) reported SI at least once during the study period. Within the group of YMSM who reported SI, a subset of men also attempted suicide at least once during that period (10% to 30% across waves). Overall, prevalence of SI decreased over the study period, from 17% of YMSM at baseline to 7% of YMSM at Month 36. Neglect of basic needs in childhood was associated with a

twofold increase in the odds of SI, and knowledge of a peer's was associated with a 75% increase in odds of SI. Perhaps not surprisingly, higher psychological distress scores were also associated with increased odds of ideation. Internalized homonegativity was unrelated to SI, suggesting that SI among these YMSM may be unrelated to internalized shame about their sexual orientation. Finally, sociodemographics (race/ethnicity, perceived familial SES, school enrollment, and sexual orientation) were unrelated to SI risk.

Synthesis of results. Taken together, these findings are evidence of heterogeneity in YMSM mental health over this period of development. Relative to the possible range of scores and observed scores, the majority of the men did not indicate high levels of distress, or high levels of internalized homonegativity. Additionally, most men did not report suicide ideation at any point during the study period. This finding is in line with current literature, which indicates that most sexual minority youth, including YMSM, are well-adjusted and do not indicate significant mental health problems.^{2; 10; 16; 51; 67; 73; 88-90;}

111

However, significant and relevant heterogeneity in the three indicators means that some YMSM are at elevated risk for poorer mental health. This heterogeneity manifested as divergent trajectories of distress, significant variability in levels of internalized homonegativity, and a subset of YMSM who had suicide ideation (and reoccurrences of ideation). Findings from the three manuscripts suggested that the salient predictors of divergences in mental health were adverse childhood experiences, interrelated psychosocial factors, and potentially, developmental processes inherent to emerging adulthood and sexual identity development.

Adverse childhood experiences. Specific adverse childhood experiences (ACEs) were relevant predictors of suicide ideation and psychological distress, although in sometimes contrasting directions. These findings are especially relevant, given that sexual minority youth disproportionately experience childhood neglect and abuse.^{2; 23; 25}

First, having experienced neglect of basic needs in childhood predicted a twofold increase in the odds of suicide ideation (Manuscript 3). This finding was in line with the existing knowledge about the long-lasting effects of childhood adversities,^{25; 78; 79} and more specifically, documented associations between childhood adversities and suicide behavior in both general populations and sexual minorities in particular.^{25; 41; 43; 71; 80}

While the current study does not have data to test this hypothesis, one underlying explanation for the association between neglect and suicide ideation might relate to developmental sequelae of neglect. That is, children who experience neglect of their basic needs in childhood may also develop insecure attachment styles and experience less social connectedness.^{82; 167} In the National Comorbidity Survey Replication, adults with insecure attachment styles were more likely to report suicide behaviors.¹⁹¹ Along these lines, childhood neglect is associated with detriments in social skills development and social integration.^{167; 190}

ACEs such as neglect also have neurobiological effects that may increase risks for suicide behavior.^{189; 195} For example, these neurobiological effects have been posited to influence emotional regulation and individuals' responses to stress¹⁸⁹ and influence states or traits such as aggression or impulsivity that is associated with suicide risk as well as future traumatic exposures.¹⁹⁵ Taken together, researchers posit that neurobiological changes arising from adversity, genetics, and interactive effects thereof give rise to other

problems and personality traits including emotional dysregulation, impulsivity, aggression, and poor attachment, which exacerbate suicide risk.¹⁸⁹ Finally, substance use may also present a more concrete pathway between neglect and suicide risk, in that childhood neglect is associated with adolescent or young adult substance abuse^{78; 167} and substance abuse is a risk factor for suicide behaviors.⁴¹⁻⁴³

Notably, the more immediate childhood problems associated with neglect (versus other forms of physical abuse) may be particularly insidious, in that the behavioral and psychological outcomes of neglect (e.g., social withdrawal) are less overt, alarming, and external than behavioral or psychological outcomes associated with physical abuse (e.g., aggressive behavior).^{82; 167} As a result, neglected youth may be overlooked by other adults, teachers, or health care providers, compared to youth with contact-related forms of abuse.

Yet, this interpretation for Manuscript 3 is challenging to integrate with the seemingly contradictory finding in Manuscript 1, where neglect of basic needs and sexual abuse in childhood predicted a better trajectory of psychological distress (i.e., declining substantially over time). Within the exclusive context of Manuscript 1, a potential explanation for this finding includes manifestations of adaptive functioning and resilience noted among SMY and YMSM.^{2; 16; 51; 67; 89; 90; 92; 196; 197} Much of the literature exploring resilience among general youth who have experienced ACEs indicates that ACEs do not always result in later-life distress. Yet, as McGloin and Widom¹⁹⁸ note, both research and clinical practice alike have tended to assume “pessimistic outcomes” for children who experience ACEs. These assumptions regarding ACE outcomes might be biased by the fact that survivors with psychiatric sequelae are more likely to seek care, compared to

survivors without psychiatric sequelae. It is plausible that ACEs may have engendered skills or coping strategies that are applicable to aspects of emerging adulthood. These youth may also have detached from abusive families earlier in life than non-abused children and thus have experienced aspects of emerging adulthood earlier than their peers. Finally, these improvements over time may also reflect regression to the mean or reactivity to the measure of distress. In Manuscript 1, membership in the highest-risk trajectory was instead associated with reported histories of parental depressive symptoms.

The contradiction of these findings between Manuscript 1 (i.e., neglect is associated with a trajectory of improvement in psychological distress levels) and Manuscript 3 (i.e., neglect is associated with increased odds of suicide ideation) might suggest that the risks conferred by neglect operate differently with regard to suicide risk versus psychological distress risk. As noted earlier, ACEs such as neglect are associated with the development of altered stress responses, impulsivity, emotional dysregulation, and poor attachment. One potential explanation is that men with these states or traits are likely to react poorly to acute stressors, despite evidencing generally low levels of distress in daily functioning. While this study did not assess antecedents of suicide ideation or attempts, it is plausible that ideation or attempts are response to acute stressors among these YMSM.

ACEs are also potential indicators of other problematic or dysfunctional family contexts or parenting characteristics⁸² and it is plausible that these statistically-significant ACEs are proxies for other aspects of family dysfunction that were not assessed in the present study. Another potential explanation relates to the recall period for the two measures. The measure of psychological distress (i.e., the cognitive-affective subscale of

the BDI-II) assessed symptoms in the past two weeks, while the recall period for suicide ideation was the past 12 months. Accordingly, it is plausible that a participant could have experienced ideation in the past year, yet report low levels of distress at the time of assessment.

Taken together, these findings suggest that early life adversities are indeed associated with distress and suicide behaviors, though with important nuance that cannot be simplified as cause-and-effect relationships. Similarly, adaptive functioning and resilience are not static and likely fluctuate and manifest differently across time and contexts.¹⁹⁹ These findings present areas for additional research. For example, analyses using growth mixture modeling with parallel processes (e.g., Greenbaum et al.²⁰⁰) might help to further identify subpopulations of YMSM with regard to the concurrence and concordance in the trajectories of distress and suicide behavior.

The parent study's approach to measuring ACEs also has strengths and limitations that must be noted. The differentiation of the types of ACEs (neglect, physical abuse, sexual abuse) is a potential strength. Childhood ACEs tend to cluster, and delineating specific ACEs may lend additional nuance to understanding how ACEs relate to health outcomes.^{79; 81; 82} However, we did not measure the age of onset or frequency of these ACEs, or outcomes such as post-traumatic stress disorder. Additionally, the item assessing sexual abuse referred only to "parents or other adult caregivers" and thus may not capture sexual abuse perpetrated by other non-caregiver adults (e.g., siblings, neighbors) based on the respondent's interpretation of the question.

Improvements in mental health over time. Each of the mental health outcomes improved with age. This aligns with existing research that indicates these improvements

in mental health are typical over time in adolescence and emerging adulthood.^{7; 57; 73; 86; 89-}

⁹³ Further, there was evidence that the decreases in distress, internalized homonegativity, and suicide ideation were steepest in the first year of follow-up (i.e., from age 18 to 19, or from age 19 to 20, depending on age at enrollment). Over time, the salience of others' negative reactions also lost its association with internalized homonegativity. In addition to the experiences of emerging adulthood, other analyses indicate that these YMSM also underwent processes of sexual identity development (e.g., sexual identity exploration, sexual identity integration) during the study period.¹⁵⁷ These observed improvements in mental health took place during a period of significant exploration and development (i.e., emerging adulthood). It is plausible that many of these men concurrently experienced both the general explorations of emerging adulthood as well as explorations related to their sexual identity development.

Explorations and independence attributed to emerging adulthood more generally might also help to explain declines in psychological distress, particularly for YMSM in Class 3 who evidenced the highest initial levels of distress that declined rapidly. These YMSM were more likely than their peers to have experienced childhood adversity. During emerging adulthood, YMSM may have had the agency to detach from abusive families of origin, whether geospatially, psychologically, or financially. As an example, though not focused on sexual minorities specifically, a recent analysis of a population-representative sample found that volunteer-era veterans were significantly more likely to have experienced ACEs than adults without military service.²⁰¹ The authors note that for many of these men, military enlistment likely provided an escape from abusive or dysfunctional families of origin.²⁰¹

Many YMSM likely encountered affirming peers and communities during this period. For example, YMSM and SMY have articulated how their experiences of marginalization eventually culminated in them finding community and solidarity with others as part of their sexual identity development.^{73; 197; 202} Importantly, their experiences of stigma and marginalization became a source of resistance and agency against the stigma and discrimination they experienced.²⁰³ These processes overlap with the creation of "chosen families"⁵⁴ which replace or compliment men's families of origin. As noted in Manuscript 2, this life-course arc appears to be an incredibly common, shared experience for many sexual minorities across age, gender, or orientation (e.g., The "It Gets Better" ProjectTM).^{88; 161} This salient theme of resilience and survival warrants further investigation as a cornerstone of future interventions that seek to reduce states such as distress or hopelessness for adolescent and emerging adult YMSM.

Sociodemographics. These analyses also responded to calls for research that examines differences in sexual minority health across sociodemographic groups.² Notably, race/ethnicity was consistently unrelated to the outcomes of interest. Perceived familial socioeconomic status was unrelated to all three outcomes. These null findings emerged despite strong evidence of other health inequalities across race, ethnicity, and socioeconomic groups.^{2; 18; 95; 96} and despite evidence of differences in acceptance of homosexuality across racial and ethnic groups.^{47; 99} Among SMY, existing studies have indicated inconsistent racial/ethnic differences in sadness, distress, or depression or suicide risk.^{7; 28; 75; 100} As noted in the Introduction, these inconsistencies (as well as the present null findings) might be attributable to the fact that some studies have assessed discrimination or victimization, while others have not. The present analyses only

examined racial/ethnic identity, and did not assess intra-group sources of stress (e.g., homophobia from within racial/ethnic groups) nor external sources of stress (e.g., racism) that YMSM potentially experience. These factors might predict differences in mental health between YMSM. These findings should be understood within the broader context that monolithic categories such as race/ethnicity and SES are somewhat crude markers for the availability of health-promoting resources and risk exposures.

Limitations and strengths.

These analyses have a number of general limitations in addition to the specific limitations noted in each manuscript. Additionally, potential strengths are also noted. First, these findings may have limited external validity. The parent study recruited a convenience sample of YMSM with specific enrollment criteria. These findings might not be generalizable to other YMSM, such as men enrolled in the military or YMSM who seroconverted before age 18 or 19. There are also geographical limitations, in that these YMSM resided in the New York City metropolitan area at the time of enrollment and the majority continued to reside in NYC throughout the study period. Generalizability may be limited with regard to non-urban YMSM or men in other cities, as well as NYC YMSM who were unable to access the study site for the minimum Baseline assessment (e.g., incarcerated YMSM, or YMSM with disabilities that precluded travel). As noted, men who relocated after the baseline completed their follow-ups using a standardized web-based survey, and it is possible that the method of survey administration could bias responses.

The convenience sampling procedures also warrant several additional caveats. First, men self-selected to participate in the study thus and may not reflect NYC YMSM as a whole. As noted, men who were unable to access the study site at baseline could not participate. Men concerned about being “outed” via study participation may also have not engaged with the study. The ability to understand spoken English was also a necessity for study participation. Outcome variables such as psychological distress, internalized homonegativity, or suicide behaviors could influence enrollment or retention, in that the enrolled sample may be lower-risk (or conversely, higher-risk) than other YMSM. Dropout or attrition may have been associated with an unobserved variable(s). Within the specific Manuscripts, I presented analyses that attempt to assess differences in retention or completion. Additionally, the study also used snowball sampling to recruit some participants; accordingly, we may have captured assortative pockets of YMSM.

There are also threats to internal validity. First, the observed improvements in mental health over time may represent phenomena such as regression to the mean or reactivity to measures. These trends might also reflect sampling bias, in that some of the recruitment venues (e.g., college campuses, community organizations) might have resulted in a sample that was not representative of all YMSM’s mental health trajectories. For example men in the sample may have been more connected to social and institutional supports than other YMSM. Additionally, several youth who indicated high risk of suicide (as screened during HIV pretest counseling) were referred to appropriate services, which may have biased future reporting by nature of social desirability and/or true improvements in mental health if they accessed care. The study did not systematically track when referrals were given or whether men acted upon these referrals. These

referrals ranged from informal requests (e.g., a participant asking if staff knew of a given type of resource) to more formal screenings and referrals (e.g., when a participant evidenced very high levels of distress).

Exogenous events or secular trends may also have influenced the longitudinal patterns observed here. These include mainstream media attention to the issue of SMY mental health, and social media campaigns such as The “It Gets Better”^{TM161} suicide prevention campaign (2010-present). These external factors could have 1) reduced distress or hopelessness of YMSM, 2) increased caregivers’ or providers’ sensitivity to YMSM mental health issues, or 3) reduced stigma, discrimination, or victimization in the social environment. Indeed, population representative surveys have found that public attitudes are increasingly accepting of homosexuality.⁴⁷⁻⁴⁹ To date, the social impact of these specific social media campaigns has not been assessed rigorously or on a large scale.

A number of strengths should also be noted. First, the longitudinal study design captured multiple points in time during a critical period of development (i.e., emerging adulthood). The sample is also diverse in terms of race/ethnicity, perceived familial SES, and sexual orientation, in contrast to the majority of existing SMY and YMSM samples. Oversampling of YMSM of color allowed for across-group analyses that have typically not been possible with the small subsamples in population-representative surveys. In terms of data completeness and quality, the study had high retention at each assessment (>80%). While data were self-reported and thus subject to recall or social desirability biases, the use of ACASI and computer-based surveys may have reduced reporting biases as well as literacy burden.^{39; 114-116}

There are also limitations with regard to constructs and measures included in analyses. It is important to recognize that analyses did not address a variety of potential risk factors (e.g., parental rejection) or protective factors (e.g., positive social support) that are relevant to YMSM mental health. In addition to analysis-specific limitations discussed within each manuscript, several general caveats for constructs are discussed here.

Race/ethnicity. Race and ethnicity were collapsed into a single variable of race/ethnicity. This variable was assumed to be time invariant, yet racial and ethnic identities may have shifted over this period. The “multiracial/other” category also collapses a variety of racial and ethnic identities into a catch-all group. Additionally, other facets of racial identity (e.g., racial identity exploration and commitment²⁰⁴) might moderate associations between racial/ethnic identity and YMSM mental health outcomes in either protective or negative directions.

Perceived familial SES. Perceived familial SES was measured using a single item intended to generalize perceived SES over the span of childhood and adolescence. Additionally, the measure of familial SES was time invariant; yet, familial SES may have may have changed or fluctuated over the course of childhood and adolescence. There are multiple potential approaches to measuring SES and each has limitations. For the present study, the current measure is pragmatic and parsimonious, given the population of interest.¹¹⁸ Alternative approaches could have included other individual-level indicators (e.g., parental income, parental educational attainment, parental occupations), as well as neighborhood- or community-level contextual measures (e.g., zip codes). It is plausible

that objective or more nuanced indicators of SES might yield different associations than the null findings observed here with regard to perceived familial SES.

Internalized homonegativity. The measure of internalized homonegativity lacks extensive psychometric validation, although it demonstrated consistently high reliability with this sample. The measure also has good face validity, and assesses domains of internalized homonegativity (e.g., wishing to be heterosexual, feeling guilt over having sex with men) that are comparable to other established measures of internalized homonegativity.⁶³ The scale also has significantly less respondent burden compared to other scales (e.g., 26 items²⁰⁵). As discussed in Manuscript 2, this scale does not have shortcomings that are noted in several existing measures of internalized homonegativity, such as items with questionable validity (e.g., items that assess perceptions of others' attitudes regarding homosexuality).^{63; 162} An additional domain not included in this measure, but of interest to future research, are reverse-scored items assessing sexual affirmation (e.g., "I am proud to be gay."¹⁶²) as in the Internalized Homonegativity Inventory (IHNI).¹⁶²

Religion in family of origin. The variable indicating religion in family of origin was also potentially reductive as it collapsed heterogeneity within religious groups. For example, the "other Christian" category included Eastern Orthodox, Quaker, Evangelical groups, and the "Jewish" category collapsed Reform Judaism with Orthodox Judaism. Across religions, there are nuances and differences in official positions regarding homosexuality. Additionally, there is a wide spectrum of "everyday"²⁰⁶ attitudes held by members of these religions that are not reflected in broad labels for religious affiliation. Other, more nuanced aspects of religion that should be addressed include religious

orientation, religiosity as a continuum, and religion as a cultural context for the family or individual.^{63; 207} Future research might also assess spirituality as a related construct.⁸⁵

Clinical implications.

These findings have implications for clinical practice and health services. First, the aforementioned relationships between ACEs and mental health are complex and nuanced among these men. Clinicians should not assume a deficit-based model for emerging adult YMSM who experience ACEs. Additionally, the theme of distress-as-impermanent may be worth emphasizing in interventions and individual-level services.

Second, there appear to be YMSM who are at higher risk than their peers for mental health problems. For men in the “moderate and increasing” distress trajectory, their moderate yet persistent levels of distress may be important signs of oncoming adult-onset major depressive disorder.¹³⁴⁻¹³⁷ While the growth mixture model did not permit the inclusion of a mental health treatment utilization variable (due to challenges in integrating time-varying covariates), existing literature indicates that earlier onset of symptoms is associated with longer delays in treatment seeking.¹³⁸ These men may not be currently accessing mental health treatment specifically, so other healthcare providers (e.g., internal medicine, family physicians) may be the first line of assessment and referral to care. Additionally, whether the underlying association is behavioral, genetic, environmental, or interactions thereof,^{79; 139} YMSM who recall depressive symptoms in their parents may be at higher risk than peers without this family history.

Third, psychological distress was consistently associated with internalized homonegativity. As noted in Manuscript 2, internalized homonegativity is inherently

stigmatic and insidious and YMSM may not overtly manifest this internalized shame. Instead, the findings here suggest that general psychological distress, possibly overlapping with reports of being hurt by or rejected by important others (e.g., family, peers) are criteria that warrant clinicians' further inquiry into potential IH. Men with IH may not disclose IH as the reason for their treatment-seeking.

Fourth, providers should also be cognizant that friends' suicide attempts are a potential risk factor for a client's own ideation. Additionally, a proportion of YMSM with suicide ideation experienced reoccurrences in ideation. Accordingly, longer-term follow-up may be warranted. While only a portion of men progressed to suicide attempts, these attempts are a known risk factor for future attempts or completion.^{21; 38; 39; 185}

Research implications and future research.

Additionally, these findings point to areas for future research. ACEs appear to be particularly salient to YMSM mental health, although in complex ways that require further investigation. Qualitative research with YMSM who have experienced ACEs might yield important insights regarding the potential resilience observed in the present analyses. Other quantitative approaches are also warranted. Path analysis may be particularly enlightening, as it would allow modeling of how these outcomes and their predictors are potentially related or overlapping. Parallel process models that simultaneously incorporate multiple growth mixture models would permit modeling of both within- and across-outcome relationships. For example, it is possible to model simultaneous trajectories of distress and internalized homonegativity, or simultaneous trajectories of internalized homonegativity and healthy sexual identity development.

Based on the existing literature and the present findings, future research might also incorporate measures of personality traits, such as impulsivity and attachment styles. These would allow for analyses that test the hypothesized mechanisms underlying the relationship between ACEs and suicide risk. The existing literature also indicates that ACEs may adversely affect social integration, and future analyses might assess whether social support moderates the relationship between ACEs and suicide risk among YMSM.

The association between peer suicide attempts and men's own suicide ideation also warrants future study. While there is a substantial body of quantitative literature demonstrating this phenomenon in adolescents more generally, less is known about the underlying mechanisms. Qualitative research could explore this phenomenon further, and may yield insights to test with advanced quantitative designs including path analysis.

The noted limitations for measures such as race/ethnicity, SES, internalized homonegativity, and religion in family of origin also suggest alternative approaches. For example, future research should also incorporate an objective measure of familial SES, and could also assess men's perceived own SES on an ongoing basis. Similarly, race and ethnicity were collapsed and considered to be static; future research might also incorporate more nuanced aspects of identity, such as racial identity exploration and commitment.²⁰⁴ As noted in the Introduction, universal and consistent measurement of sexual orientation in population-representative surveys is needed.

Qualitative research and psychometric analyses may also help to further delineate the construct of internalized homonegativity. For example, is internalized homonegativity different from self-esteem, and how?⁶³ Additionally, research that explores the performance of these measures across racial, ethnic, and cultural groups is needed.

Additionally, forthcoming data from the parent study's continuation and will yield an additional three years of follow-up. This additional longitudinal data would allow analyses that incorporate more distal outcomes (e.g., testing relationships between variables assessed at age 18 and outcomes assessed at age 24 or 25), as well as latent growth modeling with additional points of follow-up. Additional points of follow-up would allow testing of cubic models, rather than quadratic models, which might more accurately reflect fluctuations in mental health over time.

Finally, given the salience of youth and adolescent experiences across the life course (as indicated both presently and in the robust body of existing literature), future research with sexual minority youth should consider prospective follow-up that begins earlier in adolescence (e.g., age 16). The regulatory and ethics requirements for research with minors are both complex and complicated, but this does not mean that such research is impossible.²⁰⁸

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- 208 Mustanski, B. (2011). Ethical and regulatory issues with conducting sexuality research with LGBT adolescents: A call to action for a scientifically informed approach. *Archives of Sexual Behavior*, 40(4), 673-686.

Curriculum Vitae

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Educational History

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|------------------|---|
| Anticipated 2015 | Doctor of Philosophy (PhD) – Social & Behavioral Sciences Johns Hopkins University, Baltimore, MD Bloomberg School of Public Health |
| 2008 | Master of Public Health (MPH) – Community Public Health New York University, New York, NY Steinhardt School of Culture, Education, and Human Development |
| 2006 | Bachelor of Arts (BA) – Gender & Sexuality Studies New York University, New York, NY College of Arts & Sciences |

Research Foci

- Gay, bisexual, and other men who have sex with men's (MSM) health; psychosocial health; HIV prevention & treatment; substance use; social & cultural analysis of HIV and LGBT health issues.

Peer Reviewed Publications as First Author

1. **Siconolfi, D. E.**, Kapadia, F., Moeller, R. W., Eddy, J. A., Kupprat, S. A., . . . & Halkitis, P. N. (in press). Body dissatisfaction in a diverse sample of young men who have sex with men: The P18 cohort study. *Archives of Sexual Behavior*.
2. **Siconolfi, D. E.**, Halkitis, P. N., & Moeller, R. W. (2014). Homo economicus: Young gay and bisexual men and the new public health. *Critical Public Health*. [epub ahead of print].
3. **Siconolfi, D. E.**, Kapadia, K., Halkitis, P. N., Moeller, R. W., Storholm, E. D., Barton, . . . , & Jones, D. (2013). Sexual health screening among racially/ethnically diverse young gay, bisexual, and other men who have sex with men. *Journal of Adolescent Health, 52*(5), 620-626.
4. **Siconolfi, D. E.**, Halkitis, P. N., Kingdon, M., Barton, S. C., Perez-Figueroa, R. E., Arias-Martinez, V., . . . & Brennan-Ing, M. (2013). Psychosocial correlates of drug use in a sample of HIV-positive adults ages 50 and older. *Prevention Science, 14*(6), 618-627.
5. **Siconolfi, D. E.**, Halkitis, P. N., Moeller, R. W., Barton, S. C., & Rodriguez, S. (2011). HIV testing in a New York City sample of gay, bisexual, and other young men who have sex with men. *Journal of Gay & Lesbian Social Services 23*(3), 411-427.

6. **Siconolfi, D. E.**, Halkitis, P. N., Allomong, T. A., & Burton, C. B. (2009). Body dissatisfaction and eating disorders in a sample of gay and bisexual men. *International Journal of Men's Health*, 8(3), 254-264.
7. **Siconolfi, D. E.**, Halkitis, P.N., & Rogers, M. (2009). Hepatitis vaccination and infection among gay, bisexual, and other men who have sex with men who attend gyms in New York City. *American Journal of Men's Health*, 3(2), 141-149.

University Courses Taught

Instructor

- *Understanding Social Context & Risk Behavior: Public Health Approaches* (NYU, 2011; NYU, 2012)
 - Created and instructed a semester-long course for Public Health undergraduates at NYU. The course used case studies (legal substances, illicit drugs, sexual behavior, violence, and accidents & injuries) to examine: 1) the sociohistorical context of the health issue, 2) the biomedical ramifications of the risk behavior, 2) the current epidemiological data regarding the behavior and its health outcomes, and 3) current, evidence-based public health interventions at the individual, social, and policy levels. The aims of the course are twofold. First, I sought to provide an overview of current public health issues using empirical data in lecture format. Second, I sought to engage students analytically and critically with the broader historical and sociopolitical contexts of these issues, using discussions and case studies of prevention materials.
- *Health & Human Development* (NYU, 2012)*

Co-Instructor

- *HIV Prevention and Counseling* (NYU Study Abroad: London, UK - 2010)*

Teaching Assistant

- *Psychosocial Factors in Health and Illness* (JHSPH, 2014; 2015)*
- *Introduction to Sexual Orientation, Gender Identity, & Public Health* (JHSPH, 2013)*
- *Introduction To Campaigning & Organizing For Public Health* (JHSPH, 2013; 2014; 2015; 2015)*
- *HIV Prevention and Counseling* (NYU Study Abroad: London, UK, 2009; 2008)*

* = Graduate-level course